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PART 4.

Agriculture.

CORNGROWING COMPETITION.

When the Department of Agriculture decided, in 1914, to institute annual corn-growing competitions for farmers' sons and daughters under the age of 18, the response was most creditable to the lads and lasses on the land. Since the first competition, there has been an increasing number of competitors amongst the young aspiring farmers. The conditions stipulated that no assistance should be rendered to any competitor beyond the driving of horses if necessary. The entire work from preparation of the land to harvesting the crop must be done by each contestant. At the last competition it will be seen that the producer of the highest average maize crop was a young girl only 13½ years old. Her plot, entirely self-managed, yielded at the rate of 150 bushels of grain per acre.

The conditions of the competition to be held for 1920-21 are as follows:—

1. This competition will be open to all under the age of eighteen years who are residents of the State of Queensland. An entrance fee of 2s. 6d. must be forwarded to the Under Secretary with the application to enter.

2. Applications to be enrolled in the competition, containing the following particulars, must be forwarded to the Under Secretary, Department of Agriculture and Stock, Brisbane, to reach him, if possible, not later than 20th October:—

(a) Full name and address. (Give Christian names in full.)

(b) Date of birth. (Day, month, and year.)

(c) No. of Division in which applicant resides, and the name of the Dairy Inspector who supervises the locality.

3. The area to be devoted to the planting of the seed maize shall be one-tenth of an acre, selected seed for which, 1½ lb. of Improved Yellow Dent, will be posted, free of cost.

4. Each competitor shall have absolute freedom in his choice of ground, and in the methods he may adopt in preparing, planting, and cultivating his plot; the plot not to exceed one-tenth of an acre. Yields will be calculated, when judging, on the basis of this area.

The following table shows the length the rows must be to give the exact area according as four, five, six or more rows are planted:—

No. of Rows Four Feet apart.	Length of Rows in Feet.	No. of Rows Four Feet apart.	Length of Rows in Feet.
4	272 ft. 3 in.	8	136 ft. 1½ in.
5	217 ft. 10 in.	12	90 ft. 9 in.
6	181 ft. 6 in.	16	68 ft. 0 in.
7	155 ft. 7 in.	..	..

5. Each competitor will be required to keep a record chart showing the dates and particulars of the different stages of work, and these charts must be delivered, at the time of harvesting, to the officer appointed for superintending and verifying the yield, and this officer will post them on to Brisbane.

6. Within seven days from the verification of the yield from the crop, each competitor shall select, without aid from other persons, twelve uniform cobs of the maize from his crop, and forward them, with a letter of advice, to the Department of Agriculture and Stock, Brisbane. (The cobs should be packed in straw envelopes, commonly used in packing beer bottles, and then placed tightly in a case which should be labelled and branded with the initials of the competitor and the number allotted to his district.)

7. Competitors must notify the Dairy Inspector for the district of the date when the crop shall have matured and be ready for inspection. *Unless this rule is observed, the competitor will be disqualified.* The maize must be thoroughly dry and ripe when harvested.

8. No competitor shall be allowed to employ or permit any labour upon the competition plot standing in his name, other than his own personal labour, excepting in relation to the driving of horses, for which, owing to circumstances, such help may be needed.

9. The competitor in failing to observe closely the rules of this competition becomes liable to disqualification.

10. The competition will close on the 30th June, 1921, and the prizes will be allotted thus:—

The competitors will be grouped according to the following divisions:—

(1) The district supervised by—

Mr. E. W. Ladewig, Dairy Inspector, Beenleigh.

Mr. L. J. Kelly, Dairy Inspector, Harrisville.

Mr. A. K. Henderson, Dairy Inspector, Marburg.

(2) The district supervised by—

Mr. C. C. Pickering, Dairy Inspector, care of Miss Macpherson, Victoria street, West End.

Mr. R. G. Ridgway, Dairy Inspector, care of Department of Agriculture, Brisbane.

Mr. L. J. Verney, Caboolture.

Mr. R. Winks, Dairy Inspector, Gympie.

Mr. J. A. Midgley, Dairy Inspector, Bundaberg.

Mr. W. S. Harding, Dairy Inspector, Esk.

(3) The district supervised by—

Mr. J. H. Barber, Dairy Inspector, Crow's Nest.

Mr. J. J. Carew, Dairy Inspector, Gatton.

(4) The district supervised by Mr. J. Davies, Dairy Inspector, Kingaroy.

- (5) The district supervised by—
 Mr. J. D. Ogilvie, Dairy Inspector, Clifton
 Mr. S. A. Clayton, Toowoomba.
 Mr. J. R. D. Munro, Dairy Inspector, Warwick.
- (6) The district supervised by the Dairy Inspector, Gayndah.
- (7) The district supervised by—
 Mr. L. Moriarty, Dairy Inspector, Dalby.
 Mr. R. S. Sigley, Dairy Inspector, Roma.
 The Stock Inspector, Goondiwindi.
- (8) The Central District of Queensland, including that supervised by Mr. J. Cattanaach, Dairy Inspector, Rockhampton.
- (9) The Northern District of Queensland, including that supervised by—
 Mr. A. Barker, Stock and Dairy Inspector, Mackay.
 Mr. D. Downs, Yungaburra.

11. Three special prizes of the value of £10, £5, and £3 will be awarded to the competitors who stand first, second, and third in the entire competition.

District Prizes.—First, £5; second, £2; third, £1.

If there are less than six competitors, prizes will be allotted as follows:—

Four to five competitors (inclusive), two prizes, first and second.

Two or three competitors (inclusive), one prize only, first.

When only one competitor, he or she will be debarred from participating in the District Prize, but will be eligible to compete for the Special Prizes.

NOTE.—It is in the interest of the entrants to encourage others to compete for the valuable prizes being offered.

No money prizes will be given, but each successful competitor will be allowed to select some article to the value of his prize.

No prize will be awarded unless the yield of corn equals twenty bushels per acre. This stipulation may be waived under very exceptional circumstances in the case of a lower yield.

12. The aggregate points will be 100, and the judging will be based upon the following:—

(a) Quality of maize produced	15 points
(b) Yield of plot	75 "
(c) Notes and records of plot	10 "

13. The Director of Agriculture will be the sole judge of the competition, and his decision shall be final.

W. N. GILLIES, Secretary for Agriculture and Stock.

Brisbane, 1st September, 1920.

JUVENILE CORNGROWING COMPETITION.

For the juvenile corn-growing competition seventy-three entries were received by the Department of Agriculture, but only thirty-three out of this number completed the conditions, those not doing so having failed to secure a crop owing to drought or through mishap. In districts where the season was favourable high yields were secured, notably on the North Coast and in the Mary Valley (No. 2 district), where seven competitors harvested crops ranging in yield from 109.2 to 151.4 bushels per acre, the highest yield recorded being that obtained by Miss N. Pickering, of Mount View, Eumundi, who was only 13½ years old at the time her nomination was received. Although unsuccessful in winning a special prize, another girl, about a year older (Miss E. Marks, of Alberton, *via* Yatala), won the No. 1 district (South Coast) prize with a yield of 138.5 bushels per acre.

PRIZE WINNERS.

RESULTS OF JUVENILE CORN COMPETITION, 1919-20.

Name of Competitor.	Ac.	Yield per Acre in 1 bushels.	Points Awarded for Yield, Maxi- mum Points, 70.	Quality of Grain and Uniformity of Ear, Maxi- mum Points, 15.	Field Data, Points, 10.	Total Maximum Points, 100.	Remarks.
SPECIAL PRIZES.							
Miss N. Pickering, Mount View, <i>via</i> Eumundi	13½	151.4	68.4	9.9	6	84.3	No. 2 Dist. 1st £10
R. H. Pickering, Mount View, <i>via</i> Eumundi	16	146.5	66.1	10.8	6	82.9	No. 2 Dist. 2nd £5
A. G. McGinn, Oakey Creek, <i>via</i> Eumundi	15½	147.5	66.6	9.3	5	80.9	No. 2 Dist. 3rd £3

No. 1 DISTRICT PRIZES.

Miss E. Marks, Alberton, <i>via</i> Yatala	14½	138.5	62.5	9.2	7	78.7	1st
W. Schmidt, Alberton, <i>via</i> Yatala	12	96.4	43.5	11.0	4	58.5	2nd
R. Jonasson, Alberton, <i>via</i> Yatala	11	93.4	42.1	10.2	5	57.3	3rd
Reg. Crowther, Pimpama, South Coast Line	12½	94.6	42.7	9.2	6	56.9	
P. A. Abraham, Lark Hill, <i>via</i> Walloon	13½	93.2	42.1	7.4	4	53.5	
H. Beitz, Alberton, <i>via</i> Yatala	12½	77.7	35.1	10.1	4	49.2	
Miss Ruby Lehmann, Car- brook, <i>via</i> Beenleigh	13	70.2	31.7	10.5	6	48.2	
Nor. Crowther, Pimpama, South Coast Line	10	71.3	32.2	9.3	5	46.5	
C. Rehfeldt, Alberton, <i>via</i> Yatala	14½	69.4	31.3	8.7	4	44.0	
J. M. Morrison, Purga ..	13	56.9	25.7	8.7	3	37.4	
E. J. Wolff, Alberton, <i>via</i> Yatala	14½	28.3	12.7	8.9	8	29.6	
F. O. Freese, Lark Hill, <i>via</i> Walloon	14½	28.2	12.7	7.5	4	24.2	
V. F. Abraham, Lark Hill, <i>via</i> Walloon	14½	23.8	10.7	7.2	4	21.9	

No. 2 DISTRICT.

Miss N. Pickering, Mount View, <i>via</i> Eumundi	13½	151.4	68.4	9.9	6	84.3	1st
R. H. Pickering, Mount View, <i>via</i> Eumundi	16	146.5	66.1	10.8	6	82.9	2nd
A. G. McGinn, Oakey Creek, <i>via</i> Eumundi	15½	147.5	66.6	9.3	5	80.9	3rd
V. R. Ellis, Kandanga, Mary Valley Line	16½	139.3	62.9	8.5	7	78.4	
M. H. McGinn, Oakey Creek, <i>via</i> Eumundi	13½	126.7	57.2	10.8	5	73.0	
A. H. Sims, Gheerulla, <i>via</i> Eumundi	13½	115.2	52.0	12.0	6	70.0	
E. A. Sims, Gheerulla, <i>via</i> Eumundi	14½	109.2	49.3	10.1	6	65.4	
E. A. Guldbransen, Cedar Creek, Samford	16½	78.8	35.6	8.0	5	48.6	
Miss M. I. Guldbransen, Cedar Creek, Samford	17½	69.4	31.3	9.4	5	45.7	
C. A. Hansen, Perry Street, North Bundaberg	14	26.2	11.8	7.2	5	24.0	

PRIZE WINNERS—*continued.*RESULTS OF JUVENILE CORN COMPETITION, 1919-20—*continued.*

Name of Competitor.	Age.	Yield per Acre in bushels.	Points Awarded for Yield, Maxi- mum Points, 75.	Quality of Grain and Uniformity of Ear, Maxi- mum Points, 15.	Records Data, Points, 10.	Total Maximum Points, 100.	Remarks.
No. 3 DISTRICT.							
H. Morgenstein, Pinelands, <i>via</i> Crow's Nest	17	59.4	26.8	10.3	4	41.1	1st
No. 4 DISTRICT.							
S. Marshall, Cedar Gap, Wooroolin	16 $\frac{1}{2}$	36.2	16.3	8.4	4	28.7	1st
L. Wiedon, Kingaroy ..	14	25.2	11.3	6.8	7	25.1	2nd
No. 5 DISTRICT.							
G. E. Gonchee, North Killarney	17	105.9	47.8	9.4	9	66.2	1st
W. Gonchee, North Killar- ney	15	91.0	41.1	8.1	8	57.2	2nd
No. 6 DISTRICT.							
E. D. Meredith, Gurgeena, <i>via</i> Gayndah	13 $\frac{1}{2}$	26.3	11.8	8.3	5	25.1	1st
No. 9 DISTRICT.							
L. A. Favier, Kairi, <i>via</i> Tolga, North Queensland	17	105.3	47.5	9.3	4	60.8	1st
Miss I. J. M. Favier, Kairi, <i>via</i> Tolga, North Queens- land	15	96.5	43.5	8.9	4	56.4	2nd
Miss A. Windhaus, Atherton	14	86.7	39.1	10.8	3	52.9	3rd
Miss A. M. Hastie, Atherton	13 $\frac{7}{8}$	55.3	24.9	8.9	6	39.8	

No. 7 District—One competitor, failed to complete.

No. 8 District—Two competitors, failed to complete.

ENCOURAGEMENT TO COFFEE GROWERS.

In our article on the coffee-growing industry we showed how a great impetus was given to it by the appointment of Mr. Newport as instructor in that branch of tropical agriculture. There can be no question as to the suitability of the soil and climatic conditions in all the coastal districts of Queensland, and this has been recognised by the Minister for Agriculture (Mr. Gillies) who has decided to appoint an instructor who will not only give practical advice on the methods of cultivation to be adopted by intending growers, but will also introduce a system of handling the coffee for the growers, on somewhat the same lines as that which has proved so successful in the case of cotton-growing. Mr. Gillies states that in the year 1917-18, the imports of coffee into Australia amounted to 275,818 lb., which shows that there is a good demand for a product which can so easily be grown in this State. The coffee crop of 1917 amounted to about 16,000 lb., which met with ready sale at a remunerative price. Why not, then, increase the acreage until we reach the exporting instead of the importing stage?

GRAIN FOR SALE.

SEED MAIZE.

To growers desirous of obtaining supplies of a pure and reliable strain of improved seed, the following variety is being offered and represents only a limited stock raised from a selected strain of seed:—

Yellow.—Golden Beauty.

CONDITIONS OF SALE.

Applications for seed, with accompanying remittance (exchange added) should be addressed to the Under Secretary for Agriculture, Brisbane. (*Postal address and name of railway station should be given.*)

Advice will be sent when seed is despatched.

Purchasers are requested to write promptly after receipt of seed should any matters require adjustment.

PRICES.

To enable applicants living at a distance to benefit, a flat rate of 15s. per bushel is being charged. This price includes all railage to the nearest railway station, but where steamer freight is necessary this and any charges in relation thereto must be paid by the purchaser, who must furnish instructions concerning shipping arrangements and the name of agent to whom the grain is to be consigned.

Fifteen shillings (15s.) per bushel.

DESCRIPTION OF THE ABOVEMENTIONED VARIETY OF SEED MAIZE FOR SALE.

Golden Beauty.—This is a strong-stalked, fairly hardy variety, and takes about four and a-half months to mature. The ears are of medium size with a somewhat stout red core. In shape they are slightly tapering from base to tip. The rows of grain, usually fourteen in number, are set firmly on the cob. Owing to the characteristic shape of the grain (flat buck-shaped, with a slightly rounded shoulder) the furrows between the rows are a pronounced characteristic. The grain is of medium size, robust, smooth dent type, and of moderate depth; horny in character, reddish-amber in colour, with a distinct yellow cap carrying a small amount of crown starch. The ears turn down as they approach maturity, and are covered with a light "husk."

All previous lists of maize advertised for sale are now cancelled.

Pastoral.

FARMERS' SHEEP ON COASTAL LANDS.

By R. C. WILSON, Assistant Instructor in Sheep and Wool.

When speaking of sheep on the Queensland coastal areas, it is meant to include all areas on the coastal side of the Main Range anywhere between the Tweed River in the south and Cairns on the north, including all the islands inside and on the Barrier Reef, where the rainfall may vary from 40 in. to over 100 in. in places.

Should a farmer have an idea of running sheep on his farm in the coastal areas, he should first consider the suitability of his country and the class of sheep most suitable to run.

These questions, amongst other sheep information, will be fully dealt with in this article.

Although sheep can be run on any part of the coast with a fair amount of care, a farmer must have a reasonable area available in proportion to the number of stock he wishes to run, when he goes in for sheep, just the same as in any other class of stock farming.

The coastal country is very patchy, and it cannot be said that any particular number of sheep can be run until the country has been tried or inspected by an expert, who will then form his opinion after the inspection, but it can be safely said that on good Rhodes grass scrub country up to five sheep to the acre can be run. There are other good grasses that make ideal sheep feed, such as *paspalum dilatatum* and blue couch, but they are not as good as the Rhodes.

Although it is not recommended to run sheep on natural grasses, it is done with varying success in many instances, but it cannot be recommended where the black spear grass is prevalent, as this particular grass seed enters the flesh of the animal, causing serious ill-effects to the health of the animal and loss of condition, when, if not attended to, it finally dies. This grass seed can be regulated to some extent by shearing just before the seed matures, and burning off when dry enough.

On no account should a dairy farmer dispense with his dairy herd and go in for sheep at once, as he is giving up a living he knows something about to take up work he has had no experience in at all. It is always wise to learn slowly with a few sheep, and not pay too high a price for experience.

Most people when speaking of sheep farming seem to have the idea that it is only a matter of putting the sheep on the property and then sitting down until shearing and lambing time. That is a mistaken idea, and to be a success as sheep farmers they must be always attending to their flocks in some capacity, if it is only studying and watching them, when any trouble would be noticed at once.

It is not wise to run both sheep and cattle together in the same paddocks in any numbers as both will suffer in the process. It will be noticed that the cattle will go off first, as they do not do half so well on short picking as the sheep will. Sheep will do a great deal better in small paddocks, so it is wise to subdivide paddocks as much as possible, so as to change the animals about from one paddock to the other. Even if the grass does not appear any better, the stock always seem to improve on the change.

Water is very necessary, although it is often noticed on coastal country when the grass is green and moist that the sheep rarely ever go near the water, but when the grass and feed are dry the animals must have free access to it.

FENCING.

Boundary fences should always be sheep-proof; otherwise, should your neighbours have a supply of feed, or a cultivated paddock handy, and your paddocks are bare, there will always be trouble through the sheep straying and finding feed for themselves.

The only really sheep-proof fencing is wire-netting, but at the present time that is unprocureable for the small man, on account of the high prices, but there are prospects of these prices being much reduced in the near future. A six-wire fence with dropper between posts is a fairly safe fence for a well-fed flock, but would be a poor stop for hungry crossbreds with plenty of feed in sight. The only safe way to keep crossbred sheep from straying is to feed them in their own paddock, which can be done by having provision made for bad times when feed is scarce. This can be done by cultivating for your stock, and if it is not required to feed off, cut and make hay or, better still, pit or stack ensilage, which, if properly cured, can be held in reserve for years or can be used the same season. This can be done at a very small cost, and stands until required as an extra insurance against loss of stock.

It will be found in other closely-settled parts of the world where land is high-priced and in small areas, that the farmers have to cultivate for their flocks. Why not do the same in Queensland, where everything grows so well in good seasons? It is the secret of making a success of all coastal farms where stock are run, whether sheep or cattle.

Increase production by cultivating for stock in good seasons and saving the surplus for bad times, and don't make a "lazy man's country" of it. Queensland compares more than favourably with any country our lads in the A.I.F. (of whom I was one) saw in their travels; but they did see many places with more stock to the square mile on poorer land than ours, and in small areas, through intensive cultivation.

The pests to which sheep are subject on the coast are very few and easily dealt with if proper attention be given them. The two most important are stomach worms (*Strangulus contortus*) and dogs (both domesticated and wild).

The stomach worms can be avoided when stocking clean country by drenching the sheep before bringing them on to the property. A good safe drenching formula for all purposes can be procured, with instructions in pamphlet form, from the Department of Agriculture and Stock, Brisbane, free on application.

Dogs can be treated by fencing them out with wire netting, or, if that is unprocureable, a safe yard must be built near the homestead and the sheep locked up every night. After a short time the sheep will acquire the habit of coming home regularly every night, and all that will be necessary will be to count the flock, close, and fasten the gate.

There are other troubles that occur at odd times, such as tape worms in intestines, lung worm, nasal fly, sheep tick, and louse and scrub tick. Sheep are not troubled with footrot in Queensland, but scald foot often occurs on the low, wet country in good seasons. This is very easily treated by removing affected stock on to higher, dry country.

Sheep always do well on high, well-drained ridges, especially the cleared scrub ridges planted under Rhodes grass, as is seen in many parts of the coast. They suffer less from worms in this class of country on account of there being less surface water lying about, in which the worms can breed.

The breed of sheep most suitable for the farmer on the coastal lands is the crossbred, or such type of sheep as the Corriedale. What is really wanted is a large-framed sheep of good sound constitution that will bring a good price as lamb or full-grown mutton. Should the season be unsuitable for selling lambs, these mature early and cut a good heavy fleece of comeback type about 56.58 quality. Such a class of sheep can be bred from the Border Leicester and Merino cross, or, where there is a heavy rainfall and the country is inclined to be wet, the Romney Marsh and Merino cross is more suited. Lincoln, Leicester, and Dorset Horn are also good breeds to use in crossing with the Merino in Queensland. Dorset Horn has the advantage of coming into season for mating the same as Merino, which gives a better chance of controlling the lambing seasons.

All the coastal farms should run at least a few sheep, if only to breed a few killers for fresh meat on the farm, while there is a ready sale for the wool through the Wool Scheme to help the farmers to receive the best price possible, instituted and run by the Department of Agriculture and Stock, Brisbane. Such farmers' wool is received in from one fleece in a bag to fifteen-bale lots, and all that is required is to address to the Under Secretary and advise that wool is sent on, when, if required, 60 per cent. of the full value can be drawn by the farmer on arrival of the wool in Brisbane.

SOME RECORD PRICES FOR STOCK (1920).

A HIGH-PRICED COLT.

At the Doncaster Yearling Sales, Lord Glanely paid the record price of 14,500 guineas for a colt by The Tetrarch—Bluetit. Bidding was most exciting, and started at 5,000 guineas. Thirteen lots sold at the same time for a total of 54,650 guineas.

STEERS AVERAGE £44 12s.

A remarkable sale of steers is reported from Buenos Ayres, Argentine, where 12,000 steers, bred and raised on the estancia of Mr. Pedro Estanguet, were sold to the Frigorifico Anglo at 30 cents per lb. It is calculated that these steers will give 750 lb. meat per head, which is equal to 225 dollars each, which, at present rates of exchange of 47.58 pence to the dollar, means £44 12s. per head. This is considered the most important sale of beef ever held in any part of the world at one sale and to one establishment.

GREAT AVERAGE FOR PIGS.

Sixty-two head of Berkshire pigs sold at Eaton, the stud farm of the Duke of Westminster, for an average price of £115 3s. 6d. Forty-nine sows averaged £124 12s. 6d. each, and thirteen boars averaged 80 guineas each. This is considered a world's record for a herd of pigs not selected. A three-year-old sow, Eaton Belle 2nd, by War Loan, made the record price of 610 guineas to the Wellington Live Stock Company. A young sow, Eaton Winsome Lum, sold for 500 guineas to Mr. Joseph Carton, which is a record for the age; and two others made 250 guineas and 165 guineas respectively. The stock boar War Loan, and three others, made 100 guineas each.

Dairying.

PROFITS ON PIG-RAISING.

A dairy farmer in the Palmwoods district sends us the following:—

“On 9th of March last I had a litter of pigs farrowed. The sire is a medium light York and the dam a Berkshire—Poland-China cross. Of this litter, five lived. These were fed on a ration of skim milk and pollard, and latterly maize in addition. They were slaughtered at the Murarrie factory on the 18th of August, being then five months and nine days old. The recorded weights were as follows:—142 lb., 140 lb., 144 lb., 127 lb., and 123 lb., making a total of 676 lb. At 11d. per lb., the value of the five pigs is £30 19s. 8d.

The cost of food supplied amounted to £9 2s. 6d., thus leaving a net profit of £21 17s. 2d.

Poultry.

REPORT ON EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE, AUGUST, 1920.

Although westerly winds were somewhat prevalent during the month, some splendid laying can be reported, more especially during the latter part of August. Scarcely any broodies have been removed from the pens, and this materially assisted the heavy scores, as this trouble usually makes itself very noticeable at this time of the year. The single scores of the heavies again have pride of place for the month's output. R. Burns's "E" and A. Gaydon's "F" bird each laid 30 eggs, whilst A. Shanks's "A," D. Fulton's "F," and E. F. Dennis's "F" each laid 29 eggs in the 31 days. Quite a number laid from 25 to 28 eggs for the month. J. E. Ferguson's Chinese Langshan in "E" pen, by laying 27 for the month, brings her score to 107 for the five months. The highest single score obtained by a Leghorn was 27, the following breeders each having one bird which laid that number of eggs:—Haden Poultry Farm, Dr. E. C. Jennings, and L. G. Innes. Two deaths occurred during the month, S. L. Grenier losing one in his group through ovarian trouble, and Nobby Poultry Farm's "E" bird dying of tuberculosis. Green feed has been given twice daily—at midday and the last thing in the evening—consisting of lucerne, rape, mustard, and milk thistles. The following are the individual records:—

Competitors.	Breed.	Aug.	Total.
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LIGHT BREEDS.

*G. Trapp	White Leghorns	139	607
*O. W. J. Whitman	Do.	135	606
*Haden Poultry Farm	Do.	137	602
Geo. Lawson	Do.	144	600
*S. McPherson	Do.	127	577
*J. J. Davies	Do.	132	575
*J. Newton	Do.	133	567
*Quinn's Post Poultry Farm	Do.	133	557
*W. Becker	Do.	122	551
*J. M. Manson	Do.	138	551
*T. Fanning	Do.	118	537
*W. and G. W. Hindes	Do.	134	536
*Dr. E. C. Jennings	Do.	136	536
*J. H. Jones	Do.	125	533
*H. Fraser	Do.	130	527
*G. Williams	Do.	125	525
*E. A. Smith	Do.	126	510

EGG-LAYING COMPETITION—*continued.*

Competitors.	Breed.	Aug.	Total.
LIGHT BREEDS— <i>continued.</i>			
S. L. Grenier	White Leghorns ...	120	509
Thos. Eyre	Do.	132	501
*L. G. Innes	Do.	133	494
*Mrs. L. F. Anderson	Do.	136	494
*Range Poultry Farm	Do.	113	491
*S. W. Rooney	Do.	109	489
*N. A. Singer	Do.	138	489
Mrs. R. Hodge	Do.	144	482
W. Morrissey	Do.	120	475
*B. Chester	Do.	125	475
*Mrs. L. Henderson	Do.	114	464
Miss E. M. Ellis	Do.	131	458
A. J. Anderson	Do.	107	456
*Thos. Taylor	Do.	119	455
Avondale Poultry Farm	Do.	133	448
E. Chester	Do.	128	447
C. Langsbecker	Do.	119	437
H. P. Clarke	Do.	123	435
C. M. Pickering	Do.	107	431
R. C. J. Turner	Do.	123	429
C. H. Towers	Do.	124	417
S. Chapman	Do.	124	391
W. D. Evans	Do.	118	357
H. A. Mason	Do.	128	348
C. A. Goos	Do.	113	316

HEAVY BREEDS.

*R. Holmes	Black Orpingtons ...	129	642
*D. Fulton	Do.	136	635
*E. F. Dennis	Do.	139	594
*R. Burns	Do.	143	593
H. M. Chaille	Do.	148	573
*E. Morris	Do.	137	572
*A. E. Walters	Do.	110	567
*A. Gaydon	Do.	154	564
*A. Shanks	Do.	153	563
*W. Smith	Do.	132	549
*E. Oakes	Do.	135	524
J. E. Smith	Do.	150	520
*T. Hindley	Do.	116	516
*R. B. Sparrow	Do.	125	475
Parisian Poultry Farm	Do.	136	473
G. Muir	Do.	134	464
*J. Cornwell	Do.	150	457
Mrs. G. H. Kettle	Do.	131	456
R. C. Cole	Do.	114	449
*Nobby Poultry Farm	Do.	92	445
*J. E. Ferguson	Chinese Lang-hans ...	121	436
*E. Stephenson	Black Orpingtons ...	105	417
G. Flugge	Do.	125	290
Total ... ..	...	8,364	32,459

* Indicates that the pen is being single tested.

RESULTS OF SINGLE HEN PENS.

Competitors.	A.	B.	C.	D.	E.	F.	Total.
LIGHT BREEDS.							
G. Trapp	109	98	107	102	106	90	607
O. W. J. Whitman ..	99	94	106	96	103	108	606
Haden Poultry Farm ..	118	80	115	106	90	93	602
S. McPherson	103	95	87	97	108	87	577
J. J. Davies	99	95	94	115	89	83	575
J. Newton	115	88	98	67	94	105	567
Quinn's Post Poultry Farm	106	101	102	91	75	82	557
J. H. Jones	87	92	96	97	101	80	553
W. Becker	97	98	102	87	69	98	551
J. M. Manson	97	93	105	88	75	93	551
T. Fanning	87	99	91	101	104	105	537
W. and G. W. Hindes ..	98	92	78	97	79	97	538
Dr. E. C. Jennings ..	88	102	77	83	82	104	536
H. Fraser	81	77	93	94	96	81	527
G. Williams	87	88	89	87	100	74	525
E. A. Smith	82	78	97	84	89	79	510
L. G. Innes	41	77	108	82	105	81	494
Mrs. L. F. Anderson ..	103	91	98	72	66	64	494
Range Poultry Farm ..	67	82	86	99	73	84	491
S. W. Rooney	62	60	104	83	86	94	489
N. A. Singer	83	75	86	100	74	71	489
B. Chester	84	56	81	89	86	79	475
Mrs. L. Henderson ..	62	75	85	78	90	74	464
Thos. Taylor	99	84	48	81	68	75	455

HEAVY BREEDS.

R. Holmes	108	110	101	103	108	112	642
D. Fulton	111	115	96	94	87	132	635
E. F. Dennis	97	81	110	97	86	123	594
R. Burns	95	73	114	90	123	98	593
E. Morris	99	100	106	76	85	106	572
A. E. Walters	91	96	76	112	85	107	567
A. Gaydon	91	121	87	70	76	119	564
A. Shanks	74	85	97	114	66	137	563
W. Smith	78	112	99	105	76	78	549
E. Oakes	80	100	106	53	96	89	524
T. Hindley	88	108	88	107	50	75	516
R. B. Sparrow	93	26	100	96	64	96	475
J. Cornwell	74	110	76	48	63	86	457
Nobby Poultry Farm ..	80	119	59	121	46	20	445
J. E. Ferguson	33	72	61	82	107	71	436
E. Stephenson	99	74	56	88	53	47	417

The weighing of eggs is not yet completed, so that details cannot appear in this month's report.

CUTHBERT POTTS,
Principal.

FINAL REPORT OF THE SIXTEENTH EGG-LAYING COMPETITION, QUEENSLAND AGRICULTURAL COLLEGE—PART 2.

(Continued from September number of the Journal.)

GENERAL COMMENTS ON "TRUENESS-TO-TYPE" COMPETITION BIRDS.

DETAILS OF CLASSIFICATION.

		Class.		
Mrs. L. Anderson	1	Even throughout; A possesses ideal headpiece.
Haden Poultry Farm	2	D and E could do with a little more size. Taken throughout, a tight-feathered, hardy, business-like pen.
H. Fraser	2	Good size; C and D, high tail carriage; A possesses ideal body.
Dr. Jennings	3	Too high in carriage; can do with more size; an improvement on last pen; excellent doers, tight-feathered.
Range Poultry Farm	1	Very even throughout; good heads.
Thos. Taylor	2	Very uniform in size; can do with more comb; splendid eyes.
B. Caswell	2	Magnificent face and eyes; tail carriage inclined to be high.
Dixie Egg Plant	2	A big improvement in size on previous pen; B has outstanding superiority in type.
J. M. Manson	2	Very even in size and shape; F has slight side spikes on comb; excellent doers; splendid in eye and face.
L. G. Innes	3	Lack uniformity in size and shape.
T. Fanning	1	A fine pen throughout; A could do with a little more size; headpieces all that could be desired.
J. J. Davies	1	A pen we like very much in every way.
W. Becker	2	A big improvement on previous pen; tail carriage can still be lowered a little.
Quinn's Post Poultry Farm	1	Very even in type and size.
O. W. J. Whitmen	1	Approaching English standard.
G. W. Hindes	1	A, B, C, and D of exceptional merit; E and F just a trifle small.
Mrs. R. Hunter	2	Headpieces a little coarse; D, a very good specimen.
W. Hindes	1	A, B, C, and D stand right out; E and F on the small side.
W. Lyell	3	Defective combs; F, best body formation.
Mrs. A. G. Kurth	2	E, tail carriage too high; good size throughout; we like F very much for type.
E. A. Smith	2	C spoils pen, being very much on the small side; otherwise first class.
C. P. Buchanan	4	A has side spikes; C, too small; D, deformed.
H. Puff	1	Good size and type; E and F of exceptional quality.
R. Holmes	2	Fair sized and uniform; C and D, inferior combs.
E. Morris	3	B has side spikes; C could do with more size; D closely approaching ideal.
E. M. Larsen	1	Lower on leg than majority; good heads; a little more size wanted.
F. W. Leney	3	On racy side, with the exception of A, which approaches our requirements.
J. Reilly	3	Too variable; side spikes in evidence.
W. Smith	1	Good heads; have size and are not so long in back as majority; D is our choice.
T. Hindley	2	Fail in colour; B shows white in lobe; good eyes; can do with more moderation in comb.
R. Burns	2	Side spikes on E; a big improvement in type on previous pens.

GENERAL COMMENTS ON "TRUENESS-TO-TYPE" COMPETITION BIRDS
—continued.

DETAILS OF CLASSIFICATION—continued.

Class.			
D. Fulton .. ..	..	3	Fail in type and size.
Nobby Poultry Farm ..	..	2	Side spikes on F's comb a bit overdone ; splendid eyes ; first class colour and size ; an improvement.
Mars Poultry Farm ..	..	2	Side spikes on D, and F being pale in eye, spoil pen from being the most typical in the competition ; possess size, shape, and are very low.
A. Shanks .. ..	..	2	Type too variable ; D, E, and F, splendid type ; E possesses best body to our liking in the whole competition.
E. F. Dennis .. ..	..	1	Good size ; excellent heads ; could do with a little more width in proportion to their size.
A. E. Walters .. ..	..	2	Fail in headpieces ; good bodies, low set ; colour can be improved.
Kelvin Poultry Farm ..	..	1	A good uniform pen.
W. Barber .. ..	..	2	Type not consistent ; combs over developed ; low set ; feathering of tight nature.
J. Ferguson .. ..	..	3	B and C, side spikes ; type variable.
W. Morrissey .. ..	..	3	Side spikes on two individuals ; otherwise first class.
J. W. Newton .. ..	..	1	Very even birds of good type ; remarkable doers.
B. Chester .. ..	..	2	Too fine and racy ; splendid eyes and faces.
C. Goos .. ..	..	2	Good body formation ; fail in eye.
H. A. Jones .. ..	..	3	Another finely built, racy class of bird.
G. Trapp .. ..	..	2	One small specimen spoils pen completely ; good eyes and faces.
J. H. Jones .. ..	..	1	Even serviceable pen ; good doers ; size can be increased a little.
Geo. Williams .. ..	..	1	Very uniform ; excellent feeders.
Geo. Kettle .. ..	..	2	Type variable ; some inclined to beefiness in head.
N. A. Simpson .. ..	..	1	Very even ; nice textured combs ; good bodies and carriage ; shy feeders at commencement, but have improved vastly.
Mrs. N. Charteris .. ..	..	3	Uneven ; not as good doers as one would like.
H. O. Jones .. ..	..	1	A solid close-feathered pen ; good bone ; splendid feeders.
W. A. Wilson .. ..	..	2	Too fine, especially in bone.
S. McPherson .. ..	..	1	A little more size required ; excellent doers.
Oakleigh Poultry Farm ..	..	3	On fine side and variable in outline.
S. W. Rooney .. ..	..	1	Size can be improved ; excel in stamina and evenness.
Geo. Byrnes .. ..	..	3	Two small birds spoil the chance of four good ones.
R. J. Turner .. ..	..	2	Good bodies and nice size in five birds ; pen spoilt by one a trifle small and a bad doer.
Geo. Nutt .. ..	..	1	Very even ; typical headpieces ; nice shape ; good backs ; just a little more size wanted.
Burleigh Pen .. ..	..	1	Even, large, big-boned stock ; backs a little on long side.
R. B. Sparrow .. ..	..	2	A nice all-round pen ; size and shortness outstanding features ; one bird too much feather on shank.
H. Ashworth .. ..	..	1	Good size and even combs ; a trifle overgrown.
C. H. Singer .. ..	..	2	Nice type, but indifferent feeders.
J. A. Cornwell .. ..	..	1	Another big-boned pen ; a little long in back ; good doers
A. Homan .. ..	..	2	Not as uniform as we would like ; indifferent feeders at times.
A. Gaydon .. ..	..	2	Type not consistent ; one bird possesses side spikes on comb.
J. H. Dunbar .. ..	..	2	Good spangling and type, but too dwarfed.

WEIGHT OF EGGS, SINGLE HEN PENS.

	A.	B.	C.	D.	E.	F.	Pen Average.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
LIGHT BREEDS.							
Mrs. Anderson	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$
Haden Poultry Farm	$1\frac{7}{8}$	$2\frac{1}{8}$	2	2	$2\frac{1}{4}$	2	2
Harold Fraser	$2\frac{1}{4}$	2	$2\frac{1}{8}$	$1\frac{7}{8}$	2	2	2
Dr. Jennings	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{4}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{8}$
Range Poultry Farm	$2\frac{1}{8}$	$2\frac{1}{4}$	2	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{4}$	2
Thos. Taylor	2	$1\frac{7}{8}$	2	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$	2
B. Caswell	$2\frac{1}{4}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$1\frac{1}{4}$	2	2	2
Dixie Egg Plant	$1\frac{1}{4}$	$2\frac{1}{8}$	2	2	$1\frac{3}{8}$	2	2
J. M. Manson	2	$2\frac{1}{4}$	2	$1\frac{3}{4}$	2	2	2
L. G. Innes	$2\frac{1}{8}$	$1\frac{3}{4}$	2	2	$2\frac{1}{8}$	2	2
T. Fanning	2	2	$1\frac{7}{8}$	$1\frac{7}{8}$	2	$1\frac{7}{8}$	$1\frac{7}{8}$
J. Davies	$2\frac{1}{8}$	2	$2\frac{1}{8}$	$1\frac{7}{8}$	$1\frac{7}{8}$	2	2
W. Becker	$1\frac{7}{8}$	2	$1\frac{7}{8}$	$2\frac{1}{8}$	2	$2\frac{1}{8}$	2
Quinn's Post Poultry Farm ..	$2\frac{1}{8}$	2	2	2	$2\frac{1}{8}$	2	2
O. W. Whitman	$2\frac{3}{8}$	2	$2\frac{1}{4}$	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{4}$
G. W. Hinds	$2\frac{1}{4}$	2	2	2	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$
Mrs. R. Hunter	2	2*	2	2*	2	2	2
W. Hinds	2	2	$2\frac{1}{4}$	2	2	2	2
W. Lyell	$1\frac{7}{8}$	2	2	2*	$1\frac{7}{8}$	$2\frac{1}{4}$	2
Mrs. A. G. Kurth	2	$2\frac{1}{8}$	$2\frac{1}{4}$	$2\frac{1}{8}$	$2\frac{1}{4}$	2	$2\frac{1}{8}$
E. A. Smith	2	$2\frac{1}{8}$	$1\frac{7}{8}$	2	$1\frac{7}{8}$	$1\frac{7}{8}$	2
C. P. Buchanan	$2\frac{1}{4}$	2	$1\frac{7}{8}$	2	$1\frac{7}{8}$	2	2

HEAVY BREEDS.

T. B. Barber	2	$2\frac{1}{8}$	$1\frac{7}{8}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	2
Kelvin Poultry Farm	2	$1\frac{1}{4}$	$2\frac{1}{8}$ *	$1\frac{7}{8}$	$1\frac{7}{8}$	$1\frac{1}{4}$ *	$1\frac{7}{8}$
J. Ferguson	$1\frac{7}{8}$	2	$1\frac{3}{4}$ *	2	2	$1\frac{3}{4}$ *	2
A. E. Walters	$1\frac{7}{8}$ *	2*	$1\frac{7}{8}$	2	2	2	2
E. F. Dennis	$1\frac{7}{8}$	2	$1\frac{7}{8}$	2	2	$1\frac{7}{8}$	$1\frac{7}{8}$
A. Shanks	$2\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{7}{8}$	2	$1\frac{7}{8}$	$1\frac{7}{8}$	$1\frac{7}{8}$
Mars Poultry Farm	2	2	2	2	$1\frac{7}{8}$	$2\frac{1}{8}$	2
Nobby Poultry Farm	$2\frac{1}{8}$	$2\frac{1}{8}$	2	$2\frac{1}{8}$	2	$2\frac{1}{8}$	$2\frac{1}{8}$
D. Fulton	2	2	2	2	$1\frac{7}{8}$	$1\frac{7}{8}$	2
R. Burns	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$	2	2
T. Hindley	$1\frac{7}{8}$	$1\frac{7}{8}$	2	$2\frac{1}{8}$	2	2	2
W. Smith	$2\frac{1}{8}$	2	2	2	$1\frac{7}{8}$	2	2
W. H. Reilly	2	2	2	2	$2\frac{1}{4}$	$1\frac{7}{8}$	2
F. W. Leney	2	2*	$1\frac{7}{8}$	$1\frac{7}{8}$	$2\frac{1}{4}$	2	2
E. M. Larsen	2	$1\frac{3}{4}$	$1\frac{7}{8}$	2	$1\frac{7}{8}$	2*	$1\frac{7}{8}$
E. Morris	$2\frac{1}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$2\frac{1}{8}$	$1\frac{7}{8}$	$2\frac{1}{8}$	2
R. Holmes	2	$1\frac{7}{8}$	2	$2\frac{1}{8}$	$1\frac{7}{8}$	2	2
H. Puff	$2\frac{1}{8}$	2	2	$2\frac{1}{4}$	$2\frac{1}{4}$ *	$2\frac{1}{8}$	$2\frac{1}{4}$

The individual averages are obtained from the weights of six eggs. Cases where less than six eggs have been weighed are marked *. The pen average is taken from the whole 36 eggs. As each average is given to the nearest $\frac{1}{8}$ oz., the pen average is not necessarily the average of the individual averages. Examples:—

	A.	B.	C.	A.	B.	C.
	Oz.	Oz.	Oz.	Oz.	Oz.	Oz.
	2	$2\frac{1}{8}$	$1\frac{7}{8}$	2	$1\frac{7}{8}$	$1\frac{7}{8}$
	2	2	$1\frac{7}{8}$	2	2	$1\frac{7}{8}$
	2	2	$1\frac{7}{8}$	2	2	$1\frac{7}{8}$
	2	2	$1\frac{7}{8}$	2	2	$1\frac{7}{8}$
	$1\frac{7}{8}$	$1\frac{7}{8}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{8}$	2
	$1\frac{7}{8}$	$1\frac{7}{8}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{8}$	2
Average to nearest $\frac{1}{8}$	2	2	$1\frac{7}{8}$	2	2	$1\frac{7}{8}$
Average of 18 to nearest $\frac{1}{8}$	$1\frac{1}{2}$ oz.			2 oz.		

GROUP PENS.

					Average Weight of Eggs.	Variation.
LIGHT BREEDS.						
W. Morrissey	..	..	..	..	2 $\frac{1}{8}$ oz.	1 $\frac{7}{8}$ to 2 $\frac{1}{4}$ oz.
J. W. Newton	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
B. Chester	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
Chris. Goos	..	..	..	..	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
H. A. Jones	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
Geo. Trapp	..	..	..	..	2 "	1 $\frac{3}{4}$ to 3 $\frac{3}{8}$ "
J. H. Jones	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
Geo. Williams	..	..	..	..	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
G. H. Kettle	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
N. A. Singer	..	..	..	..	2 "	1 $\frac{3}{4}$ to 3 $\frac{3}{8}$ "
Mrs. N. Charteris	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
H. O. Jones	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{4}$ "
W. A. Wilson	..	..	..	..	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
S. McPherson	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
Oakleigh Poultry Farm	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
S. W. Rooney	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
Geo. J. Byrnes	..	..	..	..	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
R. J. Turner	..	..	..	..	2 $\frac{1}{8}$ "	1 $\frac{7}{8}$ to 2 $\frac{1}{4}$ "
HEAVY BREEDS.						
Geo. Nutt	..	..	..	..	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
Mrs. M. E. Smith	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
R. R. Sparrow	..	..	..	..	2 "	1 $\frac{7}{8}$ to 2 $\frac{1}{8}$ "
H. Ashworth	..	..	..	..	2 "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
C. H. Singer	..	..	..	..	1 $\frac{3}{4}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
J. A. Cornwell	..	..	..	..	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 "
A. Homan	..	..	..	..	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 $\frac{1}{8}$ "
J. H. Dunbar	..	..	..	..	1 $\frac{7}{8}$ "	1 $\frac{3}{4}$ to 2 "
A. Gaydon	..	..	..	..	2 "	1 $\frac{7}{8}$ to 2 $\frac{1}{4}$ "

In all groups at least 30 eggs were weighed, and for single pens at least 6 eggs (except in cases marked *) were taken. All results are given to the nearest $\frac{1}{8}$ oz.

(To be continued.)

QUEENSLAND PRICES CURRENT IN 1895.

A Queensland correspondent writing to his friends in Newcastle, England, 25 years ago, said:—"Things are looking up slightly, but the outlook is gloomy for the farmer. At the present time the following prices are ruling:—Maize, 8d. a bushel (56lb.); butter, 2d. to 9d. a lb.; potatoes, 1s. 6d. to 2s. a cwt.; honey, 2d. a lb.; hens, 1s. 6d. a couple; roosters, 2s. a couple; geese, 3s. 6d. a pair; turkeys, 5s. a pair; pigeons, 4d. a pair; eggs, 6d. a dozen; sheep (merino wethers) 2s. 9d. to 4s. 6d. each; pigs (prime), £1 to 30s.; cattle—fat cows, £1 10s. each; fat bullocks, £2 10s. to £2 13s. each; yearling heifers, 8s. 6d. each; draught horses, £3 10s. each; milch cows, with calves, £1 5s. each, and so on."

It may be interesting to our readers to compare our Market Report for the period from 1st July, 1896 to 30th June, 1897, published in the first issue of the *Queensland Agricultural Journal* for August, 1897, with that of August, 1920, showing as they do the great increase in the prices of stock, farm products, poultry, fruit, vegetables, &c., due mainly to the enhanced cost of materials, labour, implements, freights, &c., before and during the war, the effects of which are still being felt by all classes of the community.

Tropical Industries.

THE NORTHERN SUGAR PLANTATIONS.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report from the Field Assistant, Mr. J. C. Murray:—

“After leaving the Lower Burdekin district, the areas of Innisfail, Babinda, Gordonvale, and Mossman were visited.

INNISFAIL.

“A great deal of this year's crop has arrowed, especially that which was planted early. Many of the growers are reluctant to cut as yet, owing to the low density in much of the still growing cane, preferring to take the cane off later in the season, in hopes of a higher sugar content. With regard to tonnage, the farmer this year should get about 80 per cent. of a normal crop.

“With regard to planting and the selection of plants, greater care is required with the latter than is at present being taken by a number of farmers, especially with Badila. This variety, if it is to be maintained a high quality cane, wants careful planting and selecting. Plants should be taken from the best plant or first ratoon crop a farmer has; from, if possible, a different type of soil. The land should be thoroughly cultivated, and, to avoid the danger of being flooded by heavy rains, well drained.

“Liming and green manuring are still very necessary, for, as pointed out in previous reports, it is vital to restore the soil after a period of heavy cropping, by methods calculated to replenish the supplies of nitrogen and reduce the acidity of the soil.

BABINDA.

“Crushing was in full swing at Babinda, and matters seemed to be progressing very favourably. The cane was coming in steadily, and, although the season started with low density in the cane, a big improvement is now in evidence. The general appearance of this area is prosperous, and people are optimistic as to their future prospects.

“Much of the cane here has arrowed, as at Innisfail, and grubs are very bad in some places. Some of the growers are using arsenic.

“Considerable interest is being taken in the work of the South Johnstone Experiment Station, and growers are much appreciating the work being done there.

“With regard to new varieties, farmers would probably do well if they obtained some Q.855 and gave it a trial. There is already some Q.813 growing and looking fairly well. Growers planting their Queensland seedlings would be well advised if they did not plant too early. July or August are good months. Being rapid growers and good strikers, they have a tendency to mature quickly and will probably not give the same results if planted early.

“The use of lime is still recommended on these farms. The clearing away of scrub and old timber, roots, &c., in the vicinity of cultivation would also be an advantage, as these things harbour pests. The cutting down and burning of heavy rooting herbaceous tropical plants is especially recommended.

GORDONVALE.

“Everything is going well at the Mulgrave as far as milling and harvesting operations are concerned. Mr. Howe and his staff are very satisfied at the way things are going, and, although the crushing will not be heavy, it should be about 90 per cent. normal.

“Grubs are the principal enemies of the farmer at Gordonvale. Just at present the use of arsenic is being tried in a fairly extensive manner.

“I am satisfied that many of the cane pest problems would be partly solved if ever growers could go in for intensive cultivation.

“Planting was in progress at the time of visiting, the soil being in good condition. D.1135, Badila, and Clark's Seedling were being principally planted.

MOSSMAN.

"Having had a severe handling with the cyclone, Mossman has not quite recovered. There was a large number of heavy losses on this area, so consequently a little depression is only natural.

"Of the varieties growing, Clark's Seedling suffered the most, the Badila and D.1135 standing much better.

"One farmer, by curious coincidence, had his cane saved by the flood completely covering it and saving the crop from the devastating wind.

"However, matters are rapidly becoming normal, and planting is going ahead. The mill is having a good run and the management expects a season almost up to normal.

"An excellent deposit of limestone has been discovered near Port Douglas, and, from the crushed sample seen, should be extremely valuable for supplying agricultural lime to the farmers. This will greatly benefit the district, as lime is badly needed for the cane soils, the acidity of which is becoming more pronounced year by year.

"Meatworks fertiliser is being used by many of the growers during planting operations, to the extent of about 5 cwt. to the acre.

"Varieties doing well at Mossman are D.1135, Clark's Seedling, Hybrid No. 1, Badila, Q.813, Q.855, Mowbray Seedling, N.G.241, H.Q.409, and H.Q.458.

"Of the varieties mentioned, other than the staple ones, Q.855 will probably respond better than the rest. There are a number of other varieties in the Mossman district, but their growth is indifferent as yet.

"Cane pests are fortunately not bad this year, although the farmers always have to keep watch for wild pigs. Rats are not giving so much trouble as heretofore."

THE SUGAR CROP OF 1920.

The General Superintendent of the Bureau of Sugar Experiment Stations (Mr. H. T. Easterby) states that the estimate of the present season's cane crop is about 1,365,000 tons of cane. This should produce about 160,000 tons of raw sugar. Of this amount it is anticipated that 114,000 tons will be made by the mills north of Mackay, and 46,000 tons by those mills situate in Mackay and southwards. This great falling-off is largely due to the recent severe drought, which persisted well into the present year. With the New South Wales production added to the above figures, there will be a shortage of at least 100,000 tons of sugar, which will have to be made up by importations if the consumption of sugar remains at its present level. The outlook for next year is much more promising, due to the better price now offering, and large areas of land have been prepared for planting with cane in almost every sugar district, so that there should be a fine crop next year, given good climatic conditions.

The production of last year (1919) was 162,136 tons of raw sugar, which was made from 1,258,760 tons of cane. This yield of sugar was much better than was at first anticipated, owing to the high commercial sugar content in the cane, due partly to the drought. The tons of cane taken to make 1 ton of sugar were only 7.76, the lowest amount in the history of the industry.

"BUNCHY TOP" IN BANANAS.

The presence of this disease in some of the Southern Queensland banana plantations has aroused planters to make inquiries as to the nature and cause of the trouble and what means there are of combating it. They will do well to study the following notes on the subject by G. P. Darnell-Smith, D.Sc., F.I.C., F.C.S., which appeared in the August issue of the "Agricultural Gazette of New South Wales":—

The external signs of "bunchy top" are well known, but it may be advisable to call attention to some internal signs.

Healthy banana tissue, both of the corm and of the pseudo-stem, is almost dead white when first cut across. It may, of course, turn to purplish colour on the outside soon after it has been cut with a steel knife, owing to the action of tannin and the formation of a sort of ink.

The unhealthy tissue of a bunchy top corm is pink or reddish brown. In bananas in the incipient stages of the disease in the lower part of the corm, irregular threads, yellowish red or light brown in colour, are seen. In more advanced stages of the disease these threads are darker and reach the base of the pseudo-stem, and they may run up the stem for a considerable distance.

From these unhealthy corms, cultures of bacteria have been obtained under suitable conditions, which form white, circular, moist, glistening colonies. These colonies must consequently be regarded with suspicion.

Growers are recommended, therefore—

1. Not to plant any bulbs showing the internal symptoms referred to.
2. To dig out and *destroy completely* all bunchy top plants.
3. To keep one set of tools for dealing with bunchy top plants, and to use them for no other purposes.

Colonies of bacteria somewhat similar to those from banana corms have been obtained from the roots of sugar-cane showing signs of bunchy top.

The reddish sap that collects in the hollowed-out rhizome of a bunchy top plant has been found to have an extraordinarily rapid withering effect upon young shoots placed in it.

The presence of the reddish threads (diseased vascular bundles) is not peculiar to the bunchy top disease; they are found in other banana diseases, including the Panama disease. Dr. Brandes has given a very detailed account of Panama disease in "Phytopathology," vol. 9, No. 9. Several of the symptoms of this disease are found upon bunchy top plants. The Cavendish banana is not supposed to be susceptible to the disease, which is caused by a fungus, *Fusarium cubense*. A *Fusarium* fungus has occasionally been found upon bunchy top plants.

A bunchy top plant must therefore be regarded as possibly infectious, and the object of the present note is to inform growers of the advisability of destroying bunchy top plants completely (to dig them out and leave them on the ground is of no advantage), and to keep one set of tools for dealing with affected plants and to use them for no other purpose.

That any organism is the actual cause of a disease can only be demonstrated by a series of infection experiments carefully carried out, and these take time, but in the meantime (additional to the foregoing precautions) strict attention to the selection of healthy suckers from healthy stock, and the rejection of those showing internal signs of disease (the red threads can be seen where the sucker has been detached from the parent corm) is recommended as the surest method of eliminating bunchy top.

As still further precautions, the cut end of suckers should be dipped in lime before being planted, and places from which bunchy top plants have been removed should have lime dug into them, and new plants should not be set in such spots for a considerable period.

THE SPACING OF COTTON.

An interested grower has written asking for an opinion on the spacing of cotton plants. He referred to an article in the "Progressive Farmer" on this subject. This article gives the result of certain experiments carried out at Experimental Stations on the Mississippi regarding the yields from cotton planted at different distances apart. The general results of these experiments indicated that the closer together the plants are left in the row the higher the yield, their minimum being 8 inches. It was also stated that certain fields where the cotton was not thinned at all, but left as it came up from the planting (very thick in the row) gave more cotton than any other method. Thinning was not only an expense but reduced the yield.

Recent experiments in this country have borne out, to a point, the results secured in Mississippi. For example the Rustenberg Experimental Station ran trials with different distances of planting from 8 to 24 inches between the plants in the row. The results of these trials indicated the highest yield from planting 10 inches apart in the row. No thorough experiment has been carried out in Natal with this object, but as far as Upland cotton is concerned the results mentioned above are applicable. —South African Sugar Journal.

NEGLECTED INDUSTRIES.

RICE AND COFFEE.

There are many tropical and sub-tropical field crops which can be as easily raised in all the coastal districts of Queensland as in their native habitat. In confirmation of this statement we may instance sugar, cotton, coffee, rice, arrowroot, tea, rubber, cocoanuts, sisal hemp, bananas, spices, &c. &c.—all of tropical origin. Of all these, the sugar-cane is predominant from Southern to Northern Queensland; bananas are largely grown, and arrowroot to a limited extent, in the South; and cotton, which some years ago was grown on most farms for export, has only lately begun to attract more attention.

We wish to show the value of rice in providing the largest amount of foodstuff in densely-populated tropical and sub-tropical countries, where agriculture is the principal means of livelihood for the mass of the people. True, Queensland is not densely populated—not even sparsely so; neither does rice constitute the principal food of the white population. In all tropical countries, however, rice is the staff of life, and, as a matter of fact, rice is the principal food of about one-half of the whole population of the earth, amongst which we find China with a population of 400,000,000; British India, 300,000,000; Japan, 50,000,000—not to speak of the Dutch East Indies with its swarming native population; and close at hand the British Possession of Papua densely peopled by a rice-eating race. Concerning the latter island, we personally know that the island soil yields excellent rice of many bushels per acre.

The "Papuan Courier" recently (9th July, 1920) quoted from the Annual Government Report of the Central District of Papua, referring to the growing of rice by natives under the supervision of the Yule Island Mission Station, as follows:—"It has been known for some time that the Mekeo district land is adaptable for the production of a very good quality of rice; and for some years the natives, encouraged by Roman Catholic missionaries, have cultivated small areas of rice, with excellent effects. The great drawback to extensive cultivation by the natives is the after difficulty of cleaning the rice; and the primitive method of rubbing it between flat stones is too cumbersome, and entails more continuous labour than the ordinary type of Mekeo native is inclined to give. The Acting Assistant Resident Magistrate, writing on this subject, says:—'It is of importance to note that the Mekeo natives are likely to engage extensively in rice-growing during the coming year. This year they raised about 20 tons of rice, but, believing, as most natives do, in the sufficiency for the day, &c., combined with their proverbial hospitality, their stores of rice vanished rapidly. When the crop was garnered they feasted the whole countryside; and when their guests were leaving, they were supplied with rice for their journey home again. However, this distribution of rice will probably do good, as it will demonstrate to other native tribes the value of rice as a food, and that this food can be easily grown in the district. In fact, a healthy spirit of rivalry has begun amongst them to see who can produce the largest quantity of rice during the coming year, and I have no doubt the result will show a substantial increase on the 20 tons produced this year.'"

Many years ago, when engaged in sugar-growing at Ormeau, Pimpama, we procured some seed (paddy) rice from Japan, and planted it as an experimental crop. It succeeded admirably; and since that time, from the seed thus raised and distributed, other settlers in the district took up the matter of rice-growing, and seed was imported. This seed had not been tested or acclimatised, and the results were not satisfactory. An enterprising German settler (Claus Labrs) erected a mill for dressing the paddy, but after a few years he gave it up—partly because of the machinery (not being of the best description for dressing rice) doing its work imperfectly, but also because the rice grown by him was not the best variety for table use or suitable for the home market; so the industry, so far as the manufacture was concerned, was allowed to lapse, but the farmers still kept on planting rice, which they cut and used for fodder for their horses and stock, using the seed saved from the crop reaped for resowing the land. The consequence naturally was that the crop had deteriorated with successive plantings through the same seed being used without change.

But three things of great importance had been learned. These were—

- 1st. The suitability of the soil and climate of the Logan district for rice culture.
- 2nd. The proper time at which to sow the seed to ensure success.
- 3rd. The best system of planting and after-treatment of the crop.

There is no more difficulty in growing and harvesting Upland rice than in growing a crop of wheat, barley, or oats. In this connection we cannot do better than reproduce an excellent article on rice-growing by Mr. Fred. W. Peek in 1901, and what he then wrote is just as applicable to the present day:—

The value of rice has also been thoroughly tested as green feed for horses and stock, who eat it greedily and keep in splendid condition when fed upon it. The greatest difficulty in rice culture has been found in procuring the right seed, there being such a large variety of each kind, both with their distinctive flavour, colour, and quality, as well as in the facility with which the crop can be handled and harvested (as I will explain further on) and in the requirements of the merchant, who has his prejudices in favour of certain kinds, which more or less best suit the tastes of the consumer. This has now to a certain extent been overcome, and our farmers are now prepared to carry out this important branch of agricultural industry on sound business lines and with up-to-date methods.

PREPARING THE LAND.

Rice, like every other cereal and vegetable, to ensure good results, must have a certain amount of attention and care in preparing the land, although the question of drainage does not enter so largely into consideration as regards rice as with other cereals, and it, of course, greatly depends as to which variety of rice you intend to cultivate, but stagnant water should be avoided as detrimental. The variety I intend this article to illustrate is the "Aus," or upland rice. I have tried the "Aman" variety as an experiment, but with small success, the chief fault of the latter being the necessity of it being submerged continuously with not less than 2 to 3 inches of water, and, when the crop ripens, the difficulty of harvesting, owing to the grain being so brittle that at the least touch it leaves the ear with a consequent loss of seed. The variety of rice now grown most extensively in the Logan district is known as the "White Java," which gives a length of straw from 4 to 6 feet, with a good flag, besides a grain of good length, fairly plump, and good cropper, and, so far, seems fairly free from disease or rust. Other varieties now being tried are the "China," "Kobe Japan," "Batavia River," and "Italian Upland," of which the White Java and the Italian Upland have, some years ago, been obtained through the medium of the Agricultural Department.

In preparing the land for planting, ordinary methods need only be adopted—that is, to first plough, leaving the soil to lie for a week or so, to aerate and sweeten, then crossplough and harrow, bringing the soil to as fine a tilth as possible. The best time in this district for planting (and I should think it a suitable time for all districts south of Rockhampton) is at the end of September or at the beginning of October, when we get the first rains. In cultivating for rice on hillsides or sloping land with a natural rapid drainage, it would be advantageous to slightly terrace the land crossways to the fall of the hill, leaving an open catchment drain on the higher side, blocked at each end to conserve the rain water, because even so-called upland rice must have a certain amount of moisture, and by the construction of the above drain, or dam so to speak, the gradual percolation of the conserved water will have the desired effect of helping to supply the necessary moisture, which would be about 20 to 30 inches of rainfall spread over the period of growth. This rainfall has produced very good crops of fair yielding grain.

SOWING THE SEED.

In sowing the seed we have to be determined as to our requirements—if for cropping for grain or for fodder purposes only. There are three systems: Broadcast chiefly for fodder purposes, planting in drills, and transplanting from nursery beds. In the first instance—i.e., sowing broadcast—it will take a bushel (60 lb. of paddy) to the acre, the seed being harrowed and trenched in the same manner as oats or wheat in the after cultivation. But the plan most generally adopted, and by far the best, is planting the rice in drills 2 feet 6 inches or 3 feet apart, and about 10 to 12 inches between the plants, which may be done successfully with an automatic seeder. By this method, about 35 to 40 lb. seed to the acre are required. It ensures the crop being more even and not so patchy as when sown broadcast, and allows a better chance of going through the crop with hoe or cultivator to remove any weeds that may have made their appearance before the rice has got fairly started. The system of planting in nursery beds and transplanting out is adopted chiefly in planting swamp rice or the "Aman" variety; but, as this system of planting entails a lot of labour, I do not think it will ever come into active operation in this State. The mode of operations with this variety is briefly as follows:—Beds are prepared according to the area to be planted; a bed about 20 feet long and

6 feet wide will be amply large enough to grow plants for a quarter of an acre, the beds being well made and enriched, so as to produce vigorous plants. Sow the seed and rake in carefully, watering at certain intervals. Care must be taken to keep the plants growing. When the plants are about 6 inches high they are ready for transplanting to their permanent beds, which is done by making holes about 10 inches to 1 foot apart in the rows and 2 feet 6 inches between the rows. But, as before pointed out, this is a most tedious and costly mode of planting, and the labour involved is a serious item for consideration. You might as well try to transplant a field of oats or wheat, and expect to get a profit. So that it will be easily seen the planting in drills is at once the most economical and systematic, besides being the one most generally adopted.

HARVESTING THE CROP.

This was a difficult matter to undertake with the rice formerly planted in the Logan district, the China and some of the Japan varieties being so brittle that when ripe the least touch caused the grains to drop off with a consequent loss of seed. This has been happily overcome to a certain extent by the better variety planted. Not only does the White Java give better facility for harvesting, but the straw is of a better colour and quality, of a good length, averaging from 4 feet to 5 feet, and in good land even 6 feet is no unusual length; and no more fair or gratifying sight to the farmer's eyes can be imagined than the rich appearance of a rice field ready for harvesting: this is whilst the stalks have still a bronze-green appearance, the heads have turned a golden brown, about half-way down, and appear what a wheat farmer or an inexperienced person would deem three-parts ripe. The heads of rice, heavy with grain, have a graceful, drooping appearance; as many as thirty to forty heads have been produced from a single grain planted—the product weighing from 10 oz. to 14 oz. By cutting some varieties of rice in this state, the loss is not so great as with over-ripe grain. The cutting is begun in the morning as soon as the dew is off, the rice being bound up into very small bundles, ready to be threshed as soon as possible (which will be explained later on). Rice is never left stooked in the field, but is treated as quickly as possible.

The usual method pursued in harvesting is to cut with the ordinary sickle or reaping-hook, although where large areas are now being planted it is thought that the latest inventions of wheat-harvesting machinery could be used most effectively. A slight alteration in the reaper and binder might be required in the way of lighter and broader wheels on the rich soft rice lands, but otherwise I see no difficulty in the harvesting. At all events, it is the intention of the writer to induce some firm to make a trial at next harvesting as an experiment, and if successful a machine will doubtless be obtained on co-operative lines for the use of the district. After cutting with the sickle, the rice is gathered into bundles and carted into the barn or shed, or, if not sufficiently dry, is left for a day or so to ripen; but this is not often the case, experience having taught our farmers the right time to cut, and it is generally taken to the barn at once for stripping or threshing.

THRESHING THE RICE.

Where there are large quantities, this can be done with the ordinary flail on a threshing-floor, but other systems are in vogue where only small quantities are grown. One plan of threshing is by driving four forks into the ground, about 4 or 5 feet apart in width and 10 or 12 feet long, placing two long saplings lengthways and two crossways. Over these a sheet or tarpaulin is placed to hang and form a sort of long trough. In the centre, resting on the cross pieces, a rough kind of ladder is placed, and the bundles of rice are then beaten over the bars of the ladder, which causes the grain to drop into the bag. Some farmers merely nail a few strips across a box or wooden trough, and beat the rice out on this by handfuls. After the grain is beaten from the straw (it is then known as paddy), the next operation is the winnowing. This is done in an ordinary sieve by letting the grain fall on to a sheet in a light breeze, the sieve being held up at a little distance; its weight causes the sound grain to fall on the sheet, whilst the light grain, bits of straw, &c., are wafted away to one side. The paddy is then carefully collected and placed in the sun, spread out for a few days to get thoroughly dry, when it is bagged and stowed away in a dry barn, or else taken away to the miller for turning into the article of trade and commerce with which we are more familiar, and known as rice and not paddy. The straw, after the grain is threshed out, is spread out to dry or cure, or else it is fed to the stock. A great deal of nutriment remains in the stalk at the time of threshing, and I believe it would make up into a splendid ensilage if desired to be used when other feed is scarce. I should be pleased to hear the results if any of our enterprising farmers will give it a trial.



PLATE 17.—HARVESTING RICE.

MILLING THE RICE AND PREPARING THE CROP FOR MARKET.

This is a most interesting operation, and for the want of the necessary machinery the rice industry has lain dormant for several years in the Logan district. Every credit must be given to Mr. F. W. Peek (the writer of this article) for the energy and enthusiasm he has displayed in reorganising the industry, and the farmers, through the medium of the Logan Farming and Industrial Association, who took the matter up, believing that a great benefit would result to the district if only carried out in a systematic manner. The matter was ably discussed at their meetings. The Agricultural Department was written to for advice, and their assistance was given as far as possible to facilitate the objects sought to be obtained. It was from information supplied by the Department that the farmers were induced to co-operate in the purchase of a new and better variety of seed, a quantity of White Java—900 lb.—being purchased and distributed at first cost among the farmers; next, a small experimental patch was started, the Department supplying rice seed of other varieties, which are now being tested for their producing and milling qualities, the seeds from this source being again redistributed free of charge to those willing to grow them and still further test the various kinds submitted.

With the large increase of area planted, the want of a mill began to make itself felt. The prices offered for Queensland-grown rice were very low, principally owing to no local mills in Southern Queensland being established at that time. Again the Department of Agriculture was appealed to, and the address was obtained of the latest up-to-date firm of manufacturers of rice-milling machinery. This was the Engleburg Huller Co., of Syracuse, U.S.A., who were promptly written to for information, and price lists and catalogues were received from them. A meeting of the farmers was called, and an endeavour was made to get a co-operative mill, but without success, the general opinion being that growing and manufacture were two different branches of the business, and that milling would be better undertaken by a local sugar-miller, who would have the necessary engine power to work the rice-mill at times when the sugar season was over. This was eventually the plan adopted. Mr. Wm. Heck, who owns a sugar-mill on Pimpama Island, sent for and erected the necessary buildings and machinery as an adjunct to the sugar-milling industry. A neat weatherboard structure, the dimensions being 28 feet long, 18 feet wide, and 22 feet high (two story), was erected on stumps to keep the floors dry—an essential in rice-milling operations—a floor being placed about 10 feet high from the basement floor and extending the full length of the building. Upon this floor is erected the Engleburg Huller and Polisher, a neat little machine known as the "No. 4 size," and capable of treating half-a-ton of dressed rice per day. The paddy, being run into the hopper of the machine, falls on to a cylinder which revolves at high speed and most effectually "hulls"—that is, rubs off the cuticle or outer skin—and polishes the grain in one operation. The pollard or residuum from the rice (hulling and polishing) falls on the floor, whilst the grain itself descends to the lower or basement story of the building by means of a shoot which conducts it into a machine placed to receive it, and known as a grader, which is worked and fed automatically from the machine above. There are four sieves or sifters in this grading machine which separate the broken grains, and also the polished rice into first, second, and third quality, the rice being caught in bags or boxes placed to receive it. It is then ordinarily ready for market, but Mr. Heck has added another machine to his mill, known as an improved winnowing machine. This machine, by a series of cogs and cranks, makes the rice pass through another set of sieves, and, at the same time, the wind from a rotary fan contained in the machine and driven at a high velocity clears off any impurities of husk, dust, &c., that may be with the rice after leaving the grading machine, and completes the milling operations by finishing the product in a perfectly clean and highly polished state. Samples of this rice were exhibited at the last National Agricultural Society's Show in Brisbane, and submitted to experts, who expressed themselves as pleased at the improved samples displayed, which were equal to any imported rice of the same variety and very little different from the best Japan.

THE RICE CROP—WILL IT PAY?

This is the question invariably put to the writer whenever advocating the growing of rice as one of the crops to be successfully undertaken in the coastal districts of this State.

In the first place, take the cropping. In ordinary situations, with only fair cultivation, from 30 to 40 bushels of 60 lb. of paddy can be obtained per acre, which is double the wheat yield, the average crop of wheat being from 15 to 20 bushels per acre. I know in some instances these quantities have been exceeded in both crops, but I give a fair average for comparison. The value of wheat per bushel ranges from 3s. to 3s. 6d., whilst the value of rice sold to the local mill averages



PLATE 18.—HEAD OF RICE AND HULLED RICE.
Natural Size.

from 4s. to 5s. per bushel delivered at the mills. Then dry rice chaff is of great value as a feed for stock and horses, and I feel sure, if placed on the market and once fairly tested, it would command a ready sale. The straw is less hard, and, when well dried, compares favourably with oaten straw, and a fairly low estimate would give (according to variety grown) from 3 to 4 tons per acre, of an estimated value of £2 to £3 per ton, or an average to the grower per acre of straw and grain of £15 10s. per six months' crop. Of course, in favoured districts two crops can be obtained in the year—that is, where frosts do not appear. Then the above figures would have to be doubled as a yearly income, but, in the Logan district, only one crop of rice is taken, to be followed by a late crop of some other kind, such as oats, &c. Of course, the greatest benefit is derived by the grower on a large scale if he does his own milling. A glance at the prices paid for paddy and the prices now obtainable for the finished product will be worth consideration. Taking the current prices of rice, at the time of writing, in the Brisbane market, duty paid, best Japan is £24 per ton. The commonest quality of imported rice, "Rangoon," fetches, duty paid, £19. This price gives a fair margin of profit to the local miller if he sells at £18 per ton. The samples being milled this season at the Pimpama Island Mill are of very high grade, and closely resemble "Patna" in shape of grain, but slightly darker in colour. Taking, then, the local rice at £18 per ton market value, to produce which 1 ton 10 cwt. of paddy would be required (according to records taken at recent trials) to be milled, of a value of £12 9s. 9d.; this would leave a margin of £5 10s. 3d. I will add here that paddy rice is bought locally like wheat at 2,240 lb. per ton. Deducting the cost of milling, the average of about £2 per ton leaves the miller a net profit of £3 10s. 3d. per ton. To this must be added the value of the pollard, which also is of great value as feed for calves, pigs, or poultry, when steamed and then mixed with separator milk. Its commercial value is certainly not less than £2 to £3 per ton.

The following is taken from the Brisbane "Observer" of 29th June, 1901:—

"We were to-day shown a sample of rice grown at Pimpama Island, Moreton Bay. It resembles Patna rice in shape of grain, but is darker in colour. Qualified experts who have seen the sample say that it is the first really high-grade rice that they have seen grown in this State, and as it can be marketed at from £18 to £18 10s., should command a ready sale. The commonest quality of imported rice, Rangoon, fetches £19, duty paid, here just now, while for Japan rice £24, duty paid, is asked by the distributing houses."

The price quoted for the mill such as I have described, and which is so constructed that it can be duplicated or extended at a very small cost is, for the No. 4 machine, with a capacity of not less than half-a-ton per day, together with grader, &c., about £130, delivered at Brisbane. Of course, the buildings are extra, and the power required to drive the machinery; but worked in conjunction with any existing sugar-mill, or sawmill, &c., it would prove of great value to the district, and a source of profit on the outlay to any enterprising millowner.

FUTURE PROSPECTS OF THE RICE INDUSTRY.

Like all other crops, rice has its enemies and diseases; it has a kind of rust, smut, &c.; and in some parts of Queensland grubs will take the roots, but up to the present the grub has not caused any trouble in the Logan district. The rust has yet to be dealt with, and I think this will be accomplished by experimenting with various kinds of rice seed till we meet with a rust-resisting variety. It is probable now, that under Federation the importance of rice culture will receive the attention it is worth. A large sum of money is annually expended in importing the product into the Commonwealth States. I would therefore advise all farmers to give rice a fair trial, especially as we are growing varieties that can now be classed as fairly successful on our coast lands, and where a fair average rainfall can be partly depended upon. The value of rice grown simply as fodder to cut green is great for stock feed, the stalks being sweet, juicy, and succulent, and giving a good return per acre, and all stock will eat it with avidity. The question of labour does not enter largely into rice cultivation; as I have pointed out, although a tropical product there is every facility for cultivation by present mechanical methods—that is as far as the "Aus" or upland rice is concerned; the "Aman" or "Boro" varieties being swamp rice needing irrigation I have not yet heard of as being grown to any great extent, and they probably never will be for some time, if at all, owing chiefly to the heavy outlay required for a suitable water supply and an irrigation plant, which can be dispensed with in growing the beforementioned varieties of upland rice, which have proved most suitable for existing conditions and our present agricultural methods of cultivation and harvesting. Of this I am certain, that the rice is one of our coming crops which, together with coffee, will prove of great benefit to this State particularly, and a further source of wealth to our producers. The market for rice

in Australia is a growing one, and it will take years before the supply overtakes the demand. Our farmers need not fear to grow the crop and invest in this industry, which will return a fair amount of profit for the labour and outlay required to produce an article which only requires care in selecting and planting the varieties to suit the market requirements. I am sure the efforts of our producers will be crowned with success, and I shall be pleased with the part I have taken in assisting the modern development of rice cultivation in Queensland.

REGISTRAR-GENERAL'S STATISTICS OF RICE PRODUCTION AND IMPORTATIONS FOR THE YEAR 1900.

Total area planted in Queensland	.. ..	319 acres.
„ quantity produced (paddy)	.. ..	9,275 bushels
„ average would equal of clean rice	.. ..	320,617 lb.
The net imports of rice for 1899 were	.. ..	9,283,933 lb.
Of the value of	.. ..	£50,099

The above figures represent the position as to production and consumption, and would therefore be about 3.34 per cent. of the total requirements of this State only.

[The total annual production of rice in the United States of America, which, in 1866, was 2,000,000 lb., has now reached 350,000,000 lb. It will take 8,000 large railway cars to handle the crop this season. Rice lands have risen from £2 per acre to £3 per acre; hundreds of miles of irrigation canals have been constructed. Rice has been the redemption of the prairie lands of Texas and Louisiana. In ten years the worthless lands of these two States will produce the world's demand in rice. An acre there produces 20 sacks, worth from 10s. to 16s. per sack. Where are the Queensland farmers in the race?—Ed. Q.A.J.]

COFFEE IN QUEENSLAND.

Coffee-growing in Queensland was proved to be a payable proposition many years ago. So far back as 1897, coffee was grown on small areas, and even long before this coffee-growing was carried on successfully at Buderim Mountain by Mr. G. A. Riebe, and the late Mr. A. P. Corrie, Horticulturist at the Queensland Agricultural College, wrote as follows on Mr. Riebe's successful work in connection with this crop. He asked, "Why does coffee culture languish? Why is the coffee-culturist threatened with the fate of going down?" The reason is that there is no adequate demand. The demand is regulated by consumption. Tea is in possession, and possession is nine points of the law, and Queenslanders are inveterate tea drinkers. Between the date of Mr. Corrie's paper on coffee-growing and the present year, however, coffee has been grown on both a small and a large scale, mainly in the North, especially on the Hambleton plantation in the Cairns district, and later on at Kuranda, on the Barron River. The coffee-growers in the latter district were very successful in their operations, and for some years placed on the market a coffee which was even superior to that grown in Brazil or other tropical countries. One of our most up-to-date growers was the late Mr. Bromiley, of Pinalba, near Maryborough, and it speaks well for the excellence of his coffee that an offer was received from a British wholesale merchant who had tested the Pinalba coffee to give £90 per ton for all Mr. Bromiley's crop. This the latter declined to accept, as he easily disposed of his produce at £100 per ton.

A retrospect of this once fairly flourishing industry in Queensland will serve to show what the capabilities of the State were (and still are) for the successful and lucrative carrying on of a business which ranked high amongst our industries shortly after the appointment of Mr. Howard Newport as Instructor in Coffee Culture.

In 1903 we published a paragraph from "The Grocer and Oil Trade Review" on the coffee industry in Queensland. Coming from such a reliable authority on British trade, coffee-growers of the present day should take heart. After Mr. Newport's arrival in Queensland the coffee-planters so benefited by his experience and advice that we were not surprised to learn that the Queensland coffee rapidly gained in favour in the world's markets, or that the generally high quality was readily acknowledged. The writer of the article said:—

"The area under productive coffee trees in 1901 was 370 acres, and that under non-productive trees, 177 acres; the increase in the productive area was 87 acres. The yield for the year was 130,293 lb. It was in the North that coffee cultivation

was most closely followed. There were, in that division, 472 acres under coffee out of a total for the whole of 547 acres. It is estimated that the present production is equal to 45 per cent. of the requirements.

"In all instances where coffee is being grown and properly cultivated, paying returns are being obtained. The conditions of soil, climate, temperature, and rainfall are eminently suitable for coffee culture in Queensland. The conditions obtaining admit of its successful cultivation on the comparatively level lands, and at all elevations down to sea-level, and give the planter's an advantage over those in countries where the higher levels, steep hills, and more inaccessible places have to be sought to obtain the necessary conditions—advantages especially noticeable in the direction of cultivation and transport, and the by no means to be despised advantage of a healthy and congenial climate.

"Cairns, the principal of the coffee-growing centres of North Queensland, comprises both high and low land. The climate is perfect for coffee, the average temperature for the year being from 62 to 65 degrees Fahr., the minimum being about 36 degrees Fahr. and the maximum about 95 degrees Fahr. The rainfall average is 98.34 inches. Several estates on the lower lands, varying in elevation from 50 feet to sea-level, are doing well. The majority of clearings are, however, on the tablelands of the ranges some few miles inland. Kuranda, the central township, is reached by rail from Cairns, after a journey of an hour and a-half through most picturesque scenery. The railway line winds up the range among hills, crossing gorges, and passing waterfalls, reaching an altitude of some 1,100 feet at Kuranda itself. The climate of this tableland is clear, cool, and invigorating. Slight frosts are experienced in winter occasionally in exposed situations, but no trouble is met with in this way upon coffee clearings judiciously selected and carefully opened. The water supply is plentiful, and machinery for coffee curing in several instances is worked by water-power. The quality of the coffee produced here is high. At Kuranda a coffee-grower has opened a factory, and manufactures tins, and disposes of a large proportion of the products of the locality.

"A market for the staple exists in the State, where there are several manufacturers who buy up the coffee in the raw or parchment state. With the federation of the colonies that had been recently effected, a larger market still has been opened to this product of North Queensland, with a protection against the imported article. The consumption of the Australian continent is at present very much in excess of the production and will continue to consume all the local produce for many years. In the open markets of the world the coffee of North Queensland, though only small quantities have as yet been offered, owing to the local demand, is rapidly gaining in favour, and the generally high quality readily acknowledged. For buyers who, having no hulling machinery, desire only the clean bean, there are mills in the town of Cairns where the hulling and cleaning is done at a cost of $\frac{1}{4}$ d. per lb., after which the coffee is worth from 9d. to 1s. per lb., according to grade and quality."

In 1912 Mr. Newport wrote the following interesting article on

COFFEE CULTURE IN NORTH QUEENSLAND AS IT WAS AND IS.

"The prospects of coffee culture in the tropical parts of Australia, especially Queensland, have materially improved during the past few years. This does not mean that they were really bad at any time; for the conditions of climate and soil have not changed, and are, as they were, in advance of those in nearly every country where coffee is being commercially cultivated. The history of this staple in Queensland shows no exemption from the vicissitudes incidental, and which precedent indicates as unavoidable, to the introduction of an industry to a new country and to conditions that involve some change of method or system from that in general use elsewhere and, therefore, considered orthodox.

"In North Queensland, fifteen to twenty years ago, there was what may be called a boom in coffee—it was a very mild boom; but public opinion looked upon it particularly favourably at the time, and, having no precedent to go by, hoped great things of coffee culture.

"As a matter of fact, the coffee planted in Queensland did do well, and amply proved its suitability, with due adaptation, as an industry for the white-people tropics. In the absence, however, of professional guidance by authorities sufficiently thoroughly acquainted with the natural and life history of the plant to appreciate the bearing on its cultivation the conditions of the new country imposed, initial mistakes were made that, owing to the permanent nature of the product, were irremediable in many instances. Several fairly large plantations were opened—too large for the available labour supply; and numerous small plantings of 100 or 200 trees were made—too small to receive proper attention. Hill sides, steep slopes, and high elevations were chosen because books said such localities were essential—in some other country—

but which only served to increase the cost of production here, where (unlike most other countries) all the conditions necessary for successful cultivation may be found at sea-level and on comparatively flat land. The picking of the crop was not understood either, and was found irksome, because totally different to any kind of harvesting previously undertaken. Finally, the prices fell considerably, and droughts, floods, frost, and ticks drove many settlers temporarily away from their selections, where the little coffee patch, though it, in most instances, thrived and survived these troubles, yet was not of sufficient extent to solely support the settler and his family—and public opinion no longer looked favourably upon it. With the swing of the pendulum coffee-growing became unpopular, not because of any unsuitability of the staple to the country, but because of just such force of circumstances that every industry must meet with periodically. Had the country been more populated, or had the industry been more established, no doubt these difficulties would have been easily met and satisfactorily overcome, as industrial troubles have been, are being, and ever will be.

"Precedent also shows that rises and depressions must and do occur and recur in cycle-like courses, and that, as the metaphorical pendulum swings beyond the normal on one side, so is it inevitable that it shall return. This is now the case with coffee culture in tropical Queensland.

"In discussing the industries possible of establishment in this country, coffee has been quoted as one that has been tried and found unsuitable, or, at any rate, has not been hitherto established to any appreciable extent. One or two abandoned plantations have been cited, and what this or that pioneer in the industry has lost has been quoted; and it is implied that, therefore, coffee culture has not now, and never will have, any prospects of being successfully undertaken here. Those that argue on these lines, however, seldom state the whole facts. They are apt to forget to mention that there are any plantations at all that, having avoided (be it by chance or wisdom) the errors of others, have not merely survived, but are doing well and paying well. They omit to draw any attention to the reasons (generally obvious to those who know) of want of success in any particular instance, and it does not at the time occur to them to mention the small but eloquent fact that the price of the raw article was but little more than half what it is now when cultivation of an abandoned plantation was stopped; also, that, in by far the majority of cases, growers discontinued the cultivation of their coffee for totally different reasons than those of price, labour, or amount of crop return; but that when they had to go, the popularity of the staple having waned, no one was apparently prepared to go on where they left off, even though shown to be payable, and the cultivation of what was considered a 'fancy' product simply lapsed.

"At the time of the decline in popularity of coffee in Queensland I have stated that prices fell. This was largely (though not entirely) due to Brazilian over-production at the time, and was not, therefore, confined to Queensland. Raw coffee in Queensland reached its minimum at a value of about 4½lb. per lb. in the parchment. The pendulum in this matter is now slowly but surely swinging, and the prices of coffee all over the world are gradually rising. The present price in North Queensland for parchment coffee is 7½d. to 8d. per lb. Another point omitted is the statement frequently made to me by growers who have a little coffee, to the effect that now they wish they had more; and by a number of those who had small plantations saying that, if only they could start again now with the knowledge and experience they have, how perfectly confident they are of the success they could make of it.

"It might be asked where these plantations are that have been referred to as having successfully survived this period of depression and to be now paying so well, and how is it that we hear nothing of them? They exist at Mount Buderim, Mackay (Mount Jukes), Atherton, Kuranda, and are, many of them, giving returns of from 8 to 10 cwt. per acre as an average, and up to 20 cwt. in specially good seasons. Reference to the agricultural statistics as appearing in the last annual report of the Department of Agriculture and Stock (1911) will show that the average returns for the two districts of Mackay and Herberton were 2,304 lb. and 1,046 lb., respectively, per acre; and everyone knows that a district average must include at least a percentage of indifferently worked, as well as the properly worked, plantations. Unfortunately for the country, very little is heard of these successful plantations—not half as much as of the failures. Most of these growers are manufacturing their own coffee and find a ready local sale for it, and that within a radius of a few miles only. Their product, therefore, is seldom shipped south to the big markets of the Commonwealth—often not shipped at all, and, while there is an absolute consumption of every iota produced, the amount is insufficient to materially affect the market. Hence Melbourne and Sydney and the South generally know little and hear less of what coffee is being produced.

"This is, I think, sufficient to indicate that as times have advanced conditions have changed, and, as far as coffee culture is concerned, have improved with the

advancement, and that public opinion is recognising this and has good reasons for doing so.

"The want of success in individual instances years ago cannot rightly be taken as any criterion on which to base an assumption that coffee culture is not now worthy of attention. As a matter of fact, if we accept the simile of the pendulum, which is amply corroborated, a period of prosperity for the industry, more or less commensurate with the depression now past, is commencing.

"The main points of difference between coffee culture as a business proposition fifteen years ago and now are—Increased settlement of the country; greater facilities of transport; improvement of prices; a spirit of more open-mindedness, though perhaps greater caution (and, therefore, more business-like and sound), towards the subject; and a fuller knowledge of the requirements of the staple in this country obtained from the experience of the earlier growers.

"I would submit that all these are important factors; but, as the increase in the price of the raw article will probably appeal most strongly, from this point of view, if no other, the subject is worthy of renewed attention and close study, both as a business investment and a means of increasing settlement.

"Let us, therefore, shortly consider the culture of coffee under present-day conditions as a business proposition.

COFFEE CULTURE AS A BUSINESS PROPOSITION.

"It must be admitted that the policy of the country more especially encourages the individual settler producing for himself and by himself. This being so, the large estates and plantations commonly existing in (usually black labour) countries where coffee is grown are not adapted to Queensland, and the plantations must be limited in area practically to what one settler can manage. Let the area then be limited, for the purpose of this paper, to, say, 15 acres.

"The cost of the opening may be put down at—Land, £5 per acre (outright purchase); felling, £2; clearing, £2; plants, £1; planting, £2; total, £12 per acre; and for 15 acres £180; buildings and machinery necessary for a plantation of this size, £250. Add to the capital the cost of upkeep, until in bearing, one man's wages at 8s. a day for three years, £375, involving a total investment of a capital of £805. This is an outside estimate, in that new scrub land is allowed for and outright purchase instead of selected Government land and long terms. The capital investment necessary may be very materially reduced by an individual worker in many ways, as, for instance, taking up some of the already cleared and stumped banana land (perfectly suitable for coffee), which would not only probably cost less, but save several pounds per acre in felling and clearing; and by possibly not drawing to the full extent on the 8s. a day set aside as cost of living, inasmuch as a great deal might be produced on the farm to reduce this cost, and in growing catch crops, such as bananas or vegetables, between the coffee during the initial period of waiting; also, the interest accruing on £150 of the £250 set aside for buildings (which would not be required until the estate came into bearing) would be of some assistance during the first three years.

"In the matter of returns the first and possibly second crops would but cover expenses. Once in full bearing and properly opened, an average crop of 10 cwt. per acre may be safely anticipated. With this, as with other staples, its successful production depends very largely on the cost of harvesting; 1d. per lb. is admitted generally as a fair price to pay for the picking of coffee berries. Indeed, it is a high price when it is considered that this amounts to more than half and almost two-thirds of its value; but it were better to overstate than understate this unavoidable item in the production. One penny per lb. means that a man labourer must pick 96 lb. per day to make wages—say, 100 lb.; but the work requires no special strength

"It must, however, be remembered that since Mr. Newport wrote the above the cost of land, labour, provisions, implements, &c., has greatly increased, and taxation, freights, &c., have to be considered. But in some instances, as at Pialba, notwithstanding these increased expenses, coffee planting is yet a paying proposition.

or effort, and is therefore suitable for youths, boys, and girls, who can often earn comparatively high wages. I have already mentioned the record of a boy picking 190 lb. in a day. Ripe coffee berries (or cherry) produce one-fifth to one-fourth of their weight in dry marketable produce called 'parchment.' Let us take the lesser figures, and so leave a still broader margin. A return of 10 cwt. (parchment) per acre would, therefore, involve a cost of harvesting for the whole plantation of not more than £350, and to this must be added the cost of annual upkeep of £125, making a total of £475. The $7\frac{1}{2}$ tons at, say, $7\frac{1}{2}$ d. per lb. would be worth £525, to which must be added the Federal Government bonus of 1d. per lb. of clean coffee, equal to £7 per ton in parchment, amounting to £52 15s., making a total gross annual return of £577 15s., and net returns of £102 15s.

"This, it may be said, discloses no fortune—it does not, but it must be borne in mind that minimum averages rather than maximum returns have been taken, and also that allowance for the living of the grower at 8s. a day has already been made, and the £100 odd means, therefore, *profit*, and represents a rate of interest on the greatest amount of capital invested of some 12 per cent.

"There is no reason why the area under cultivation should not be increased beyond the 15 acres suggested according to the capacity of the settler, more especially if the coffee be grown under shade, reducing the amount of pruning, weeding, and field attention necessary.

"The larger the area the greater the rate of profit, as the cost of the buildings and plant need not increase; but the obtaining of sufficient labour for harvesting would become a matter of some moment if the area were very materially increased.

"The harvesting of a 10-cwt. crop spread over four months would require just over one hand for every 2 acres; so a 10-acre plot, although the total returns are not so large, can often be harvested by the grower's own family.

"To newcomers to the colony with small capital, with or without a family (but especially to the family man), the cultivation of coffee in North Queensland offers excellent investment and prospects of an independent and healthful life in the production of a commodity the market for which is rising as well as increasing locally—a plantation of which, sufficient to return an income of £4 per week, need not exceed an area that the owner can himself manage (with the exception of the harvesting only), and which, once established, requires no replanting, remaining a source of income for the rest of his life."

In the Annual Report of the Department of Agriculture and Stock for 1918-1919, the Under Secretary writes on the subject of coffee-growing:—

"The cultivation of coffee has had a chequered existence in this State, and notwithstanding the excellence of the product the industry, instead of advancing, is steadily declining. The tendency in the tropical part of the State to pay attention to nothing but the cultivation of sugar-cane, and the difficulty in obtaining labour for picking at prices that would enable the profitable production of coffee, are undoubted obstacles; but the fact remains that critics and connoisseurs on the London market have spoken very highly of Queensland-grown coffee. A letter recently received from London describing a meeting at the Royal Colonial Institute upon coffee mentions the opinion of Mr. Farrar, a high authority on choice coffee, who was present, as expressed in the following words:—

"He tells me his ambition is to have at one time five bags in one lot of that choice Queensland coffee he lectured upon (a sample sent home to the Agent-General for exhibition purposes), and with that quantity he would so place it that the coffee-growing world would be agog with it."

"Such testimony needs no comment, and should have a great effect upon the industry, not, perhaps, in the direction of the establishment of large estates, which would at harvesting time employ a considerable number of people for the picking, but rather in encouraging the cultivation of a few trees on farms as a means of subsidiary profit."

In the year 1918 the production of coffee amounted to 13,129 lb., a decrease of 3,113 lb., as compared with the crop for 1917.

Botany.

ILLUSTRATED NOTES ON THE WEEDS OF QUEENSLAND.

By C. T. WHITE, F.L.S., Government Botanist.

No. 18.

ONION WEED (*ASPHODELUS FISTULOSUS*, Linn.).

Description.—A perennial somewhat fleshy herb. Leaves crowded at the base of the plant; about 1 ft. long, narrow-cylindrical, hollow. Flowering stems 2 or to nearly 3 ft. high, branched in the upper portion, hollow. Flowers in long slender racemes; whitish, a little over $\frac{1}{2}$ -in. across; the six perianth segments each with a dark-coloured midrib. Stamens six, filaments whitish, enclosing the ovary by their concave bases, which, examined under a strong lens, are seen to be papillose on the back; anthers deep orange coloured. Pistil in the centre of the flower consisting of a small green ovary at the base, a comparatively long slender stigma topped by a capitate 3-lobed style. Seed capsule roundish, small (about 2 lines across), 3-valved, the valves when dry and ripe transversely wrinkled. Seeds angular, black, deeply and transversely pitted, 3-6 in each capsule.

Distribution.—A native of the Mediterranean region, now a common weed in many countries. In Australia it occurs in nearly all the States. In Queensland it was first noted about Toowoomba in 1909, specimens being collected by Mr. H. A. Longman and forwarded to the late F. M. Bailey. Since that date it has gradually spread till it has become one of the worst weeds of the Toowoomba district. It has spread to a few other localities on the Darling Downs, but it is not likely to prove a pest in any other than Darling Downs localities.

Common Names.—In Australia it is most commonly known as "Onion Weed," sometimes as "Wild Onion"; but this latter is apt to cause confusion with another weed—*Allium fragrans* or *Nothoscordum fragrans*. Another English name is "Onion-leaved Asphodel."

Uses.—The closely-allied Asiatic *A. tenuifolius* (by most botanists regarded merely as a small form of the European *A. fistulosus*) is largely used in India during times of drought or famine as a human food, and the European and Asiatic plants are so much alike that, as far as properties are concerned, they can be treated as one, and are done so in "The Agricultural Ledger of India," 1902, No. 7, which is devoted to an account of the plant and its uses.

It is there stated that the green plant is cooked as a vegetable, and the ripe seeds gathered and ground into flour. From the bulbs a strong glue suitable for bookbinding, &c., has been prepared; alcohol can also be made from them. In the Paris Exhibition, as far back as 1855, papers and cardboards of various qualities, manufactured from the leaves and stalks of the plant mixed in various proportions with rags and common paper stuff, were exhibited. The seeds contain a good drying oil.

Other Properties.—It is sometimes thought the plant is poisonous, but as it is used so extensively in India as a vegetable this is not likely; but it would no doubt taint the milk of milking cows that happened to feed off it. However, it is one of those plants that is, as a general rule, left more or less untouched by stock.

Eradication.—The best way of treating it is to deal with it before it gets a hold in a locality by forking the plant out, care being taken not to leave any bulbs in the ground. In larger areas it will be found more difficult to deal with, and will probably mean more than one season's work. Where the plants are very thick, spraying with an arsenical solution or other weed-killer might be effective. In dealing with closely-allied plants in America, it has been found practicable to loosen them by ploughing, and by turning pigs on to the loosened soil to eat out the bulbs and fleshy underground parts so exposed. A method that has also been found practicable in pasture land is to turn sheep or goats on to the infested country, salting a number of the tufts from time to time to make the plants more palatable to them.

PLATE 19.—ONION WEED (*Asphodelus fistulosus*).

A Leaf. A¹. Transverse section of leaf. B. Top of flowering stem.
C. Seeds natural size and enlarged.

Entomology.

CANE GRUB INVESTIGATION.

The General Superintendent of the Bureau of Sugar Experiment Stations has received the following report upon Cane Grub Investigations from Dr. J. F. Illingworth, Entomologist to the Bureau:—

"We have been experiencing weather remarkably warm for this season of the year. Then, too, the heavy rains at the end of July, which reached to a depth of 2 ft. in the loose soils at Greenhills, created a condition most favourable for the destruction of the few remaining grubs in the disease areas. The results have been most encouraging, for it is now difficult to find healthy living grubs in what may be termed the old-infested area—i.e., that part of the estate bordering the forest of feeding trees.

"Furthermore, I am pleased to report the establishment of the Tachinid (*Ceromasia spheonophori* Vil.) parasites of the borer beetle in the Babinda area. They are being liberated in other districts.

NOTES ON *LEPIDIOTA ALBOHIRTA* (GREYBACKS).

"As indicated in previous reports, these grubs were very late in their activities this year; hence, at the end of July, I was not surprised to find many of them still feeding in the areas where no disease existed. Normally, at that time of the year, they are all down deep in the soil pupating, or, in some cases, even changed to the adult beetle, waiting for the heavy rains to penetrate and soften the soil so that they can escape from their prison.

DISEASE.

"I have followed up the rapid mortality in the old area at Greenhills, and have carried out numerous laboratory experiments with the two diseases to determine their virulence. Undoubtedly, cool weather is an important factor when combined with moisture. It was very noticeable that the death rate was rapid when the nights were chilly, and fell off almost altogether with the advent of warmer weather.

"In one experiment, I placed thirty-six healthy greyback grubs in a large pot of disease-infested soil from Greenhills. The weather was cool and the mortality rapid. The first week twenty-one had succumbed—fifteen from the bacterial disease and six from the fungus. The second week was somewhat warmer, and ten died—four from bacteria and six from fungus. The third week finished the lot—one dying of bacteria and four of fungus. Hence, in the twenty-one days, 55.5 per cent. died of bacteria and 44.5 per cent. of fungus; total, 100 per cent.

"In other experiments, started later, when the weather had warmed up considerably, the results were far less satisfactory. Apparently a difference of only a few degrees in the temperature makes considerable difference in the virulence of these diseases. On 2nd August I placed nineteen healthy grubs in separate pots of the contaminated soil from Greenhills, watered them well, and set them on a table in a warm, sheltered position in the sun. After a week none was dead; the second week only two died of the fungus. I then removed the pots to a place under the laboratory. 10 degrees cooler, with the result that mortality rapidly increased—most of the deaths being due to the fungus.

"Investigation has been carried on in other localities, in the hope that we might find these diseases widely distributed. Unfortunately, I have not been able to find them anywhere else in the Mulgrave area, though the Muscardine fungus is plentiful further up the line towards Babinda.

"While at Mossman recently, we made a thorough search for dead grubs in the limited areas where the pest appeared this year, but we had no definite results. Only two blackened remains were unearthed, but they were both decomposed and powdery, so it was impossible to say whether the bacterial disease had destroyed them or not.

"The sudden disappearance of the pest at Mossman a few years ago suggests that the grubs might have been wiped out by an epidemic of these diseases. I was hopeful that we might find some diseased grubs as conclusive evidence, but in all of our digging the grubs appeared to be perfectly healthy, except as noted above.

"I am inoculating quantities of soil with the diseased grubs and distributing this to areas where it is not found at present. This will probably prove the most practical method of distributing the contagion. It will be recalled that our efforts at breeding the Muscardine fungus on starchy material gave no apparent results when applied to the grubs in the soil.

"Each dead grub produces literally millions of greyish-green spores, which soon become dry and dusty, so that they will inoculate bushels of soil if thoroughly mixed. It will be best to scatter this soil in furrows as widely as possible in infested fields. I must call attention, however, to the fact that may not be evident at once, that the disease only works under exceptional climatic conditions, such as we have experienced this year; yet the important object is to have the fields inoculated for such occasions when they do occur, for apparently the spores are able to maintain themselves for extended periods where introduced. I draw these conclusions because I have found evidence of the fungus every year in the same fields at Greenhills, though there has been no epidemic until this season.

TACHINID PARASITES OF THE BORER BEETLE.

"While in Babinda on 8th August I learned from Mr. P. C. H. Rutherford that he had just sent in to the mill the last of his cane from the block where I had liberated these parasites on 16th June last year. I went to the millyard at once and located the trucks by looking up the numbers at the weighbridge. I was surprised to find very few borer signs in the ends of the sticks, for the crop was fully 50 tons per acre and very soft—a condition ideal for these beetles; last season it was simply riddled by them. It will not be difficult to imagine my feelings when I found the puparia of the parasites in the first cocoon that I located with my penknife. Further search disclosed them in practically every infested stick that I opened. I found the maggots in the borer grubs, puparia in the cocoons, and even saw newly emerged flies resting on the sticks of cane. This is especially interesting since they must have developed in millions from the twenty flies liberated a year ago.

"It is hard to estimate the value of the assistance rendered by these parasites. Careful figures in Hawaii showed that they brought down the infestation from 30 per cent to 12.77 per cent. shortly after their introduction. On another plantation it was estimated that there was an increase in the sugar content amounting to .98 ton per acre, which would mean 75,000 to 90,000 dollars for a plantation of 1,000 acres. Moreover, the following year, when the flies became better established, this figure was augmented by a further increase of 1.25 tons per acre, which would mean more than double the above annual saving. (Hawaiian Sugar Planters' Ass. Ent. Series, Bulletin No. 13, p. 42.)

"In the region where the flies are established at Moolaba they will have every opportunity to spread, for this is the largest area supplying cane to the Babinda Mill—several blocks of 1,280 acres each are adjoining. Furthermore, the cane in that locality of abundant rainfall is of rank growth, and fully infested with the borers under normal conditions. And, again, it will be an easy matter to extend their range to the Innisfail district, which usually suffers considerably from the pest.

BREEDING PARASITES PROGRESSING AT MERINGA.

"The large cage at the station has been continually stocked with the flies, and colonies have been liberated from time to time in the borer-infested fields along the Mulgrave River. So far we have been unable to find the parasites established here; hence it will probably be well to continue our efforts for a time.

"I had a wire from Mr. Crees, the manager of the Mossman Central Mill, stating that the parasites were abundant in the cane which was being cut on his farm, so I went over and collected as many as possible. Like most insects at this season of the year, the flies had largely emerged. They were sitting about everywhere on the cane leaves, and we found abundant empty puparia. Furthermore, most of the grubs in the fallen cane under the trash were not parasitised. It appears to be the off-season for their activities, since I found fully 90 per cent. of the grubs parasitised in May, at a time when all insect life is active.

THE LINEAR BUGS ACTIVE.

"This new pest of cane (*Phenacantha australica*, Kirkaldy) is exceedingly abundant in many fields in this district, and it appears to be widely spread. I found it was just as prolific at Mossman and, last year, in the Innisfail region. Fortunately, it is a pest which only increases rapidly during the dry part of the year; hence we experience the greatest numbers during the cutting season, at a time when the growth of the cane is not materially interfered with. Nevertheless, when they are in such numbers and all sucking from the under surface of the leaves, they must materially reduce the sugar content, a fact worthy of notice when the cane is sold on relative analysis. Furthermore, if these bugs turned their attention to the young cane they would be a serious menace.

CONTROL MEASURES ADVOCATED.

"This is a pest that multiplies particularly in grassy fields; hence I would advocate clean culture, particularly clean headlands, and, as far as we know at present, firing the trash should help materially in eliminating them. Their close relatives, the Chinch Bugs of the United States, are greatly reduced by these methods."

General Notes.

A REMARKABLE RUBBER DISCOVERY.

A discovery of the highest importance has been made by a lecturer in chemistry at the Manchester (England) School of Technology. When rubber and sulphur are mixed together at a high temperature the rubber becomes hard and tough—"vulcanised" is the technical term for the change. While rubber can stand the necessary heat, other raw materials with which it might be usefully mixed would be destroyed. The new invention is a cold process, in which two gases are used to produce the free sulphur required in vulcanising. When crude rubber, either in the solid or the liquid form, is treated with the two gases it becomes efficiently vulcanised, and when it is mixed with any waste material, such as sawdust, leather scraps, or paper, a similar change takes place without the properties of the waste material being affected. This discovery is to be applied immediately to the manufacture of linoleum, the heavier classes of wallpaper, and artificial leather for upholstery. It is also applicable to the manufacture of one-piece boots (of rubber and leather scrap) and of felt (combining rubber and "shoddy"). There will also be developments in connection with motor tyres.

SOCIETIES, SHOW DATES, ETC.

MACHINE CREEK (*viâ* MOUNT LARCOM).—Machine Creek Dairymen's Association. Secretary: J. C. Jocumsen.

GOOMBOORIAN (*viâ* GYMPIE).—Goomboorian and Ross Creek Branch of the North Coast Fruit Growers' Association. Secretary: J. P. Jackson.

THE PRODUCTION OF MINT FOR ITS OIL.

By MR. A. J. PINN, Inspector of Agriculture

Peppermint grows most profitably on non-acid peaty soils, but if the moisture is good little trouble will be experienced even on upland soils. There is a large market in this State for both oil and dried leaves, but the crops has never been cultivated to any extent except for supplying mint for the vegetable market.

The crop is propagated from roots and runners from old plantations, and set in rows 3½ feet apart and 4 to 5 inches deep. The roots are carried in a sack over the shoulder, and are dropped into the furrow and covered by scraping the soil with the foot. One acre of old bed will provide sufficient plants for 10 to 20 acres.

Harvesting is done about the time the plant comes into bloom and before the lower leaves drop. The yield of oil is always greatest in hot, dry weather, and heavy rains at harvest time reduce the yield. On large areas the harvesting and curing are somewhat similar to haymaking. The mint may be cut with a mowing machine and allowed to lie in the swath for about a day or longer according to the weather, to allow of the evaporation of excess moisture and wilting of the leaves. The crop is placed in windrows, cocked, and then taken to the still. If the hay is fairly dry, a charge of the still (steam process) should not take longer than thirty to forty minutes, but a damp sample may require two hours.

In the United States, where the crop is extensively grown, two crops are obtained annually, though the second crop is only about half the quantity of the first cut. The conditions under which this crop is usually grown in America are cooler than ours and we should therefore produce more crops. The yield varies from 25 to 80 lb. of peppermint oil per acre, averaging about 40 lb., and about 20 lb. from the second cut. The amount of hay averages 1 to 1½ tons per acre, and if dried after distilling can be fed to farm stock. The plantations are profitable for eight or ten years.

The prevailing prices are 20s. per lb. for spearmint oil and 15s. to 18s. for for peppermint. The market for the dried leaves also offers inducements to the prospective peppermint grower. Leaves at present fetch 2s. 6d. per lb., and the normal pre-war figure ranged round 1s. 3d. The existing supply (as of other dried herbs) is considerably smaller than the demand.—'Agricultural Gazette of N.S.W.,' Vol. XXXI, Part 6.

Answers to Correspondents.

PAPER MONEY.

J. C. "DIGGER"—

Although your questions are not on agricultural subjects, we give you the information, as it may be of some interest to our "Digger" readers.

Paper money, according to the historian of the conquest of Granada and Spain, Washington Irving, was first issued by the Count de Tendilla, the Christian governor of the important port of Alhama when that stronghold was besieged by the Moors in 1483, over 400 years ago. Since that date the world has been inundated with paper money.

Field hospitals and surgeons were first heard of in Spain when the Moors were laying waste the country around the ancient city of Antequera, where King Ferdinand of Spain had collected an army of 6,000 horse and 12,000 foot in 1484. Every precaution had been taken to provide this army with all things needful for its extensive and perilous inroad. Numerous surgeons accompanied it to attend to all the sick and wounded without charge, being paid for their services by Queen Isabella, wife of King Ferdinand. The queen also, in her considerate humanity, provided six spacious tents, furnished with beds, and all things necessary for the wounded and infirm. These hospitals afterwards accompanied all the great Spanish expeditions against the Moors, and were called "The Queen's Hospital." Such was the first known introduction of a regular camp hospital in campaigning service.

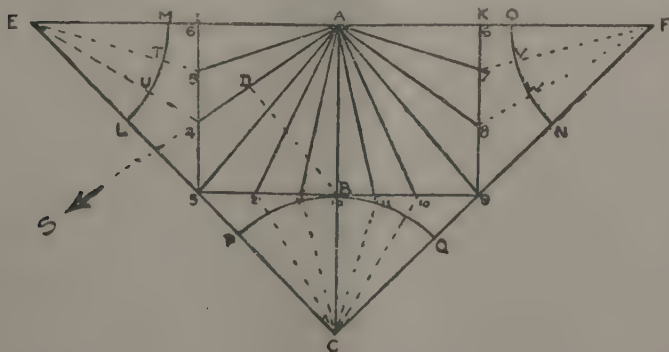
The worthy padre, Fray Antonio Agapida, whose MSS formed the basis of Washington Irving's account of the conquest of Granada, affirms that the first occasion of the use of gunpowder in a mine was the blowing up of the foundation of a tower of the fortification of the city of Malaga by the Christians in 1488.

CONSTRUCTION OF A SUNDIAL.

"NEW CHUM," Belvidere Orchard, Amiens.

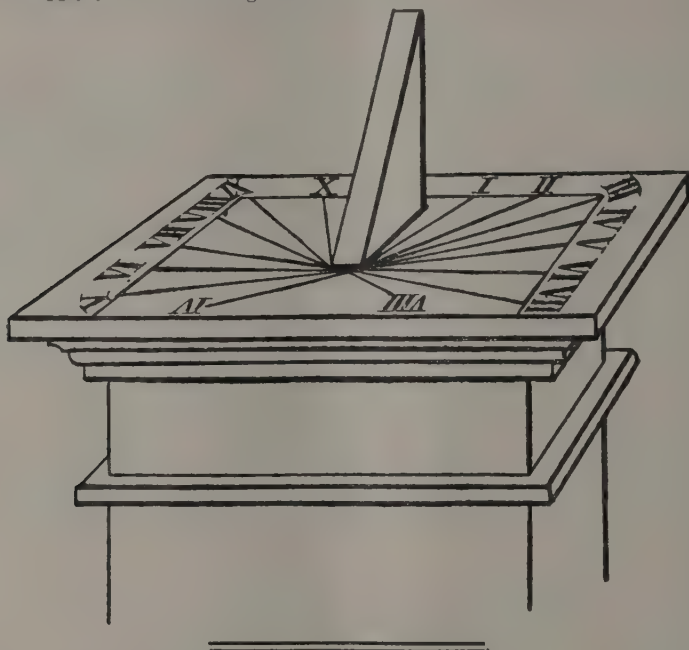
1. Your change of address has been noted.
2. A Sundial is constructed as follows:—

The "style" or pin of the dial, called the "gnomon," shows the hour of the day. This must be 6 inches long—no allowance for thickness. It must be in the vertical plane, and make an angle of 51 degrees 18 minutes with the horizontal plane. The dial plate is laid out this:—Draw EF and AC for 6 and 12 o'clock lines, and make angle CAS equal to the latitude of the place—say this is $57\frac{1}{2}$ degrees. Draw DB at right angles to AS, cutting AC in B. Lay off distance DB from B to C. Make AE and AF equal to AC. Join EC and FC. Through B draw 3B9 parallel with EF.



With centre C through these points, draw C1, C2, C11, C10. With E and F as centres, draw segments ML and ON, and divide each into three equal parts. Through 3 and 9 draw 3I and 9K parallel with AB. From E and F through TU and VW draw E5, E4, and F7, F8. Lastly, from A draw lines to 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, and these will be the hour lines required.

All this trouble can be saved by writing to a mathematical instrument-maker, who will supply you with dialling scale.



SUGAR AND ALCOHOL FROM THE NIPAH PALM.

The Nipah palm (*Nipa fruticans*) is one of the very few tropical plants which occur in pure stands over extensive areas in Borneo. In common with many other palms, its sap contains sugar, and laboratory experiments conducted at the Bureau of Science, Manila, indicate that production of sugar from Nipah palm sap would be a commercial success. According to these experiments it is estimated that there would be at least 12 per cent. of recoverable sugar in the sap, and the average annual yield of 4,000 gallons of sap per acre of Nipah under management should produce about 4,000 lb. of sugar.

Although the production of sugar from the Nipah sap is still in the experimental stage, the manufacture of alcohol from the same source is a well-established industry. For many years the natives of the Philippines have been producing a low grade distillate averaging about 25 per cent. alcohol, which has been used as a beverage. Lately the crude stills which produced this distillate have largely been replaced by modern distilleries, of which seventy-five were in operation in 1913. These produced 2,500,000 gallons of distilled spirits. Over 98 per cent. of this production is diluted and used for beverages, and the balance utilized as fuel for lamps, stoves, and motors.

The Nipah palm grows in dense formation on tidal areas throughout all of the Eastern tropics. Very extensive areas are to be found in Borneo, and the British North Borneo Government estimate that at least 300,000 acres exist at very accessible points throughout their territory. One block of 57,000 acres has already been surveyed on the West Coast and certainly another 100,000 acres can be reached within four hours by launch from Sandakan on the East Coast, and the same can be said as regards Tawau on the East Coast, but further south. Bulletin No. 3 of the Department of Forestry, British North Borneo, discusses the possibilities of establishing this industry in Borneo.—“Agricultural News,” Vol. XVIII, No. 457.

[The Nipah Palm thrives in Papua on most river banks—Ed. “Q.A.J.”]

RAINFALL IN THE AGRICULTURAL DISTRICTS.

TABLE SHOWING THE AVERAGE RAINFALL FOR THE MONTH OF AUGUST IN THE AGRICULTURAL DISTRICTS, TOGETHER WITH TOTAL RAINFALLS DURING AUGUST, 1920 AND 1919, FOR COMPARISON.

Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.		Divisions and Stations.	AVERAGE RAINFALL.		TOTAL RAINFALL.	
	Aug.	No. of Years' Records.	Aug., 1920.	Aug., 1919.		Aug.	No. of Years' Records.	Aug., 1920.	Aug., 1919.
<i>North Coast.</i>					<i>South Coast—continued:</i>				
	In.		In.	In.		In.		In.	In.
Atherton	0·91	19	0·43	0·52	Nambour	2·08	24	1·56	0·85
Cairns	1·86	38	0·33	0·61	Nanango	1·47	38	2·21	0·96
Cardwell	1·29	48	3·93	0·56	Rockhampton ...	1·00	33	1·52	0·45
Cooktown	1·43	44	0·14	0·81	Woodford	1·95	33	1·01	0·66
Herberton	0·68	33	1·41	0·48					
Ingham	1·43	28	1·50	0·31					
Innisfail	6·00	39	2·07	2·55					
Mossman	1·38	12	1·49	0·79					
Townsville	0·46	49	1·62	0·03					
<i>Central Coast.</i>					<i>Darling Downs.</i>				
Ayr	0·50	33	2·53	0·56	Dalby	1·27	50	1·69	0·76
Bowen	0·69	49	2·59	0·23	Emu Vale	1·25	24	1·53	0·67
Charters Towers ...	0·52	38	1·35	0·11	Jimbour	1·33	32	1·69	0·59
Mackay	1·04	49	3·27	0·38	Miles	1·26	35	1·47	0·61
Proserpine	1·17	17	3·57	0·88	Stanthorpe	1·92	47	2·02	0·73
St. Lawrence	0·89	49	2·53	0·21	Toowoomba	1·81	48	1·89	0·58
					Warwick	1·55	33	1·84	0·98
<i>South Coast.</i>					<i>Maranoa.</i>				
Biggenden	1·23	21	0·87	0·84	Roma	0·98	46	1·48	0·53
Bundaberg	1·42	37	1·45	0·48					
Brisbane	2·19	69	1·16	0·69					
Childers	1·29	25	1·42	1·17					
Crohamhurst	2·43	25	1·39	0·82					
Esk	1·66	33	1·54	0·79					
Gayndah	1·27	49	1·41	0·94					
Gympie	1·90	50	1·52	0·36					
Glasshouse M'tains	1·76	12	0·67	0·99					
Kilkivan	1·60	41	1·90	1·14					
Maryborough	1·80	49	1·90	1·42					
					<i>State Farms, &c.</i>				
					Bungeworgorai ...	0·98	6	1·45	0·47
					Gatton College ...	1·30	21	1·32	0·42
					Gindie	0·79	21	1·32	0·81
					Hermitage	1·50	14	2·06	0·87
					Kairi	1·09	6	...	0·52
					Sugar Experiment				
					Station, Mackay ...	0·91	23	3·21	0·10
					Warren	0·98	6	2·11	0·46

NOTE.—The averages have been compiled from official data during the periods indicated; but the totals for August this year, and for the same period of 1919, having been compiled from telegraphic reports, are subject to revision.

GEORGE G. BOND, State Meteorologist.

The Markets.

PRICES OF FARM PRODUCE IN THE BRISBANE MARKETS FOR SEPTEMBER, 1920.

Article.		SEPTEMBER.	
		Prices.	
Bacon	...	lb.	1s. 5d.
Bran	...	ton	£9
Broom Millet	...	"	£25 to £40
Broom Millet (Sydney)	...	"	£21 to £45
Butter (First Grade)	...	cwt.	238s.
Chaff, Lucerne	...	ton	£7 to £11 10s.
Chaff, Mixed	...	"	£6 6s. to £10 6s.
Chaff, Oaten (Imported)	...	"	£14 to £15 10s.
Chaff, Panicum	...	"	£5
Chaff, Wheaten	...	"	£5 to £7
Cheese	...	lb.	1s. 2d.
Flour	...	ton	£19 10s.
Hams	...	lb.	1s. 8d. to 1s. 11d.
Hay, Lucerne	...	ton	£5 10s. to £6 10s.
Hay, Oaten	...	"	...
Honey	...	lb	7½d.
Maize	...	bush.	5s. 6d. to 8s. 1d.
Oats	...	"	4s. to 4s. 9d.
Onions	...	ton	£23
Peanuts	...	lb.	7d. to 9d.
Pollard	...	ton	£10 15s.
Potatoes (English)	...	"	£15 to £17
Potatoes (Sweet)	...	cwt.	5s. to 6s. 6d.
Pumpkins	...	ton	£4
Turnips (Swede)	...	cwt.	4s. to 5s. 9d.
Eggs	...	doz.	1s. 4d. to 1s. 7d.
Fowls	...	per pair	7s. 6d. to 13s. 9d.
Ducks, English	...	"	5s. 6d. to 6s.
Ducks, Muscovy	...	"	7s. to 9s.
Geese	...	"	10s. to 11s.
Turkeys (Hens)	...	"	15s. to 18s.
Turkeys (Gobblers)	...	"	27s. to 35s. 6d.
Wheat	...	bush.	...

VEGETABLES—TURBOT STREET MARKETS.

Asparagus, per dozen bundles	...	12s. to 18s.
Beans, per sugar bag	...	3s. to 7s.
Beetroot, per dozen bunches	...	6d. to 9d.
Broad Beans, per sugar bag	...	2s. 6d. to 3s. 6d.
Cabbages, per dozen	...	1s. to 3s.
Cauliflowers, per dozen	...	1s. 6d. to 6s.
Carrots, per dozen bunches	...	...
Lettuce, per dozen	...	2d. to 6d.
Marrows, sack	...	3s. to 6s.
Peas, per sugar bag	...	2s. 6d. to 4s.
Potatoes (Sweet), per sugar bag	...	3s. to 4s. 6d.
Pumpkins (table), per dozen	...	4s. to 6s.
Tomatoes, per quarter case	...	10s. to 15s.
Turnips (Swede), per sugar bag	...	2s. 6d. to 3s. 6d.

SOUTHERN FRUIT MARKETS.

Article.	SEPTEMBER.	
	Prices.	
Bananas (Tweed River), per double case	17s. to 26s.	
Bananas (Queensland), per double case	25s. to 30s.	
Bananas (Fiji), per double case ... ..	...
Lemons, per case	3s. to 5s.	
Mandarins, per case	5s. to 12s.	
Oranges (common), per bushel case	3s. to 8s.	
Oranges (Navel), per bushel case	6s. to 14s.	
Passion Fruit, per bushel case	10s. to 15s.	
Pineapples (Queens), per double case	14s. to 15s.	
Pineapples (Ripley), per double case	10s. to 12s.	
Pineapples (common), per double case	3s. to 8s.	
Tomatoes, per quarter case		

PRICES OF FRUIT—TURBOT STREET MARKETS.

Apples, Eating, per bushel case	15s. to 17s. 6d.
Apples, Cooking, per bushel case	14s. to 15s.
Bananas (Cavendish), per dozen	4d. to 10d.
Bananas (Sugar), per dozen	5d. to 6d.
Citrons, per cwt.	14s. to 15s.
Cocoanuts, per sack	£1 5s.
Cumquats, per quarter case	4s. to 5s. 6d.
Custard Apples, per case	3s. 6d. to 5s.
Gooseberries (Cape), per quarter case	9s. to 12s. 6d.
Gooseberries, per quart	9d. to 10d.
Lemons (Lisbon), per quarter case	3s. to 5s.
Mandarins, per case	10s. to 18s.
Oranges (Seville), per cwt. ... ..	...
Oranges (Navel), per case	12s. to 15s.
Oranges (other), per case	4s. to 6s.
Papaw Apples, per case	2s. 6d. to 5s. 6d.
Passion Fruit, per half bushel case	8s. to 15s.
Peaches ... ..	...
Pineapples (smooth), per dozen	5s. to 8s.
Pineapples (rough), per dozen	6s. to 8s.
Strawberries, per dozen boxes	4s. to 12s.
Strawberries, per tray ... ..	...
Tomatoes, per quarter case	8s. to 15s.

TOP PRICES, ENOGGERA YARDS, AUGUST, 1920.

Animal.	AUGUST.
	Prices.
Bullocks	£21 10s. to £34 5s.
Cows	£12 10s. to £14 17s. 6d.
Merino Wethers	53s. 6d.
Crossbred Wethers	50s. 6d.
Merino Ewes	45s.
Crossbred Ewes	39s.
Lambs	39s. 9d.
Pigs (Porkers)	101s.



Subterranean Clover.

THIS wonderful Clover is the most nutritious herbage grown. It grows in dry sandy soil and gravelly pastures, and sows itself when once it gets a start. This can be claimed for no other Clover. Splendid for grazing, very fattening. Cattle may run or graze upon this Trifolium without harming it.

Subterranean Clover has no equal for the general purposes of excellent feed, pertinacity of reproduction, supply of humus, and charging the soil with nitrogen. It is more economical and effective in providing humus and nitrogen to the soil than any other plant known to the Scientific world. Land sown with it will annually produce a crop from its buried seed pods for many years.

Clean Seed, 7/6 lb. ; 7/- lb. in 14 lb. lots or more ;
6/6 lb. in 28 lb. lots or more.

LAW SOMNER
PTY. LTD.,

SEED AND PLANT MERCHANTS (Established 70 years)
139-141 SWANSTON STREET, MELBOURNE.

Orchard Notes for November.

THE SOUTHERN COAST DISTRICTS.

November is somewhat of an off month for fruit, as the crop of strawberries is about over; pineapples, with the exception of a few off season fruit, are not ready for marketing; and citrus fruits of all sorts, with the exception of those grown in the latest districts, are now over. Bananas should, however, be improving, particularly if the season is favourable.

The most important work of the month is the cultivation of the orchard, as, in order to retain moisture in the soil, it is essential that the soil be kept in a fine state of tilth. Where the land is liable to wash, breaks should be left between the fine-worked land, or, even better, a good break of cowpea or other leguminous crop, valuable for producing nitrogen and humus, should be grown. All fruit pests should be attended to; cyaniding can be carried out where necessary, and is especially useful now in the case of the Red, Purple, Mussel, Circular Black, and Glover Scales. Fruit fly should be systematically fought; all infested plums, peaches, guavas, or other fruits should be gathered and destroyed, so as to prevent the spread of the pest. Sucking bugs of all sorts should be gathered and destroyed, the egg-clusters, as well as the immature and mature insects, being destroyed. Hand-gathering is as good a plan as any. Fig beetles should be destroyed by spraying with Kedzie's mixture; and the egg-clusters should be destroyed whenever found.

Bananas and pineapples can be planted during the month, taking care, in the case of the pineapples, not to set out suckers that will immediately throw out a fruit, but those that will become firmly established before they fruit. Examine the vineyard carefully, and keep it well worked. Look out for Oidium and Black Spot, and treat for same as recommended in the Orchard Notes of the two previous months.

Early ripening grapes will be reaching maturity towards the end of the month; but few, if any, will be ripe. In any case do not market too immature fruit; rather wait a few days longer, till it is fit to eat.

THE TROPICAL COAST DISTRICTS.

The main crop of pineapples will ripen during the month; and if gathered at the right time—viz., when fully developed, but not turned colour—they will carry all right South, if carefully handled and well packed. Papaws and granadillas are still in season, and will meet with a good Southern demand; they must be packed in cases containing only a single layer of fruit, and should be sent in the cool chamber. I am certain that a good market can be got for these fruits in both Melbourne and Sydney, particularly at this time of the year, when their winter fruits are off and their summer fruits are not yet on.

Watch bananas carefully for fly. Keep the orchards well cultivated.

Only ship good mangoes South; for too much rubbish is sent to Brisbane. Good mangoes will pay to pack properly, but the common sorts, which predominate to an enormous extent, will barely pay freight, if there is a good crop. The canning of good types of fibreless mangoes of good flavour is well worth taking up commercially in the North, as a ready sale for the canned fruits can be obtained.

As in the Southern Coast districts, all fruit pests should be systematically fought, and the orchard should be kept in a good state of tilth, as, once the wet season starts, there is little chance of cleaning up weeds and rubbish of all kinds, or of cultivating and sweetening the soil.

THE SOUTHERN AND CENTRAL TABLELANDS.

The earlier kinds of summer fruits, such as cherries, will ripen during the month. See that, if fruit fly makes its appearance, it is systematically fought.

Look out for Codling Moth, and continue the spraying with Kedzie's mixture.

Look out carefully for any San José scale that may have escaped the winter spraying, as, if the trees are sprayed whilst the young are hatching out, the bulk of the insects are killed and little damage is done either to tree or fruit.

The sulphide of soda spray is one of the best to use now. Keep Woolly Aphis in check, should it make its appearance, using the resin washes; or, if it and San José scale are both present, use the sulphide of soda spray.

Watch the vineyards carefully for Black Spot and Oidium. Keep the orchard and vineyard well cultivated, so as to retain all the moisture in the soil required for the growth of the tree and development of the fruit. In the warmer parts, irrigate when necessary, following the irrigation by deep and systematic cultivation.

See that grape vines have plenty of foliage to protect the ripening fruit from sun scald, but yet not so dense a foliage as to induce Oidium or Black Spot. Look out for Red Scale on citrus trees, and cyanide to check same. Look out for fruit fly in the early ripening fruits, and gather and destroy all that may be so affected.

Farm and Garden Notes for November.

FIELD.—Under ordinarily favourable conditions, harvesting the wheat and barley crops may now begin. Those who have oats for hay should cut it when the grain has formed, but before it is ripe, for then the plant is in its most nourishing condition. Destroy caterpillars on tobacco plants, and top the latter so as to throw all the strength into the leaves. Keep down the weeds, which will now try to make headway; earth up any growing crops requiring the operation; sow maize, imphee, setaria, kafir corn, teosinte, sorghum, cotton, &c. Plant sweet potatoes, sisal hemp, yams, peanuts, and ginger.

KITCHEN GARDEN.—Why do so few gardeners and farmers grow their own vegetables? This is a question frequently asked by visitors to the farming districts. The reason probably is, that vegetables require a good deal of care and attention, which means also a good deal of time taken from the ordinary farm work. In many cases it pays the farmer better to buy many kinds of vegetables than to grow them himself. The only vegetables grown on many fine farms are cabbages and pumpkins, not to class potatoes under the head. Many people have an idea that European vegetables cannot be grown during the hot summer months, but this is a great fallacy; the Chinese gardeners supply the towns with all kinds of vegetables, except, perhaps, cauliflowers, during the whole of the summer. It is, therefore, clear that, by constant work, plenty of manure, water, and some shade for seedlings, most vegetables can be produced during the hot months from November to March. If your ground has been trenched or deeply dug and well worked, the advantages will be seen during the coming months. It does not pay to work shallow-dug ground. When sowing and planting during this month, give plenty of room between the rows and the plants; otherwise they will be drawn up and worthless, and keep the ground open by constant forking and hoeing. Thin out melon and cucumber plants. It is a good plan to peg down the vines; they will then not be blown about by the wind; they will take root at intervals, and thus help the main stalk. Give plenty of water to tomatoes planted out last month. They should also be mulched. Sow cabbage, French beans, melons, lettuce, radishes, pumpkins, cucumbers, marrows, rosellas, &c., and transplant for succession in calm, cloudy weather.

FLOWER GARDEN.—Stake any dabbias which may be now above ground, and plant out the bulbs which were stored in a moist place. If the weaker bulbs are reserved, they will come in for autumn planting. Take up all bulbs which have done flowering, and store them in a dry place. Winter-flowering plants will have gone off almost; still, the garden should be in full bloom, and will well repay the trouble bestowed on it, and a little fertiliser given as a top-dressing will assist the plants to bloom and look well for a longer time than if they were neglected. Give weak liquid manure to chrysanthemums, and allow no suckers to grow till the plants have done flowering. Take up narcissi. Do not store them, but plant them at once in new situations. Sow antirrhinum, balsam, zinnia, summer chrysanthemum, calliopsis, and nemophila.

SEED TESTING.

Samples of any seeds purchased or offered for sale as seeds for sowing may be sent to the Department of Agriculture and Stock for analysis.

WEIGHT OF SAMPLE TO MAIL.

Wheat, Oats, Barley, Maize, Rice, Rye, Peas, Cowpeas,	
Beans, Tares	8 oz.
Millet, Sorghum, Sudan Grass, Panicum, Buckwheat,	
Lucerne, Clover, Linseed	4 oz.
Rhodes, Paspalum	2 oz.
Turnip, Cabbage, Parsnip, Carrot, and Vegetable Seeds of	
like size	$\frac{1}{2}$ oz.
All Seeds other than those included above	2 oz.
Vegetable Seeds in made-up packets	3 packets

When drawing a sample be careful to obtain a quantity from the top, bottom, and middle of each bag. These should be thoroughly mixed to ensure the sample being uniform.

The name of the seed, with name and full address of the sender, should be on every sample.

If the result of the test is required for purposes of sale, a fee of 2s. 6d. per sample will be charged.

No charge will be made to Farmers sending in samples of the seed that they have purchased as seed for sowing, providing the following particulars are given:—

Vendor's name and address.

Name of seed.

Quantity purchased.

Date of delivery.

Locality where seed is to be sown.

Name and address of purchaser.

Samples, with covering letter, should be addressed to—

UNDER SECRETARY,

DEPARTMENT OF AGRICULTURE AND STOCK,
BRISBANE.

ASTRONOMICAL DATA FOR QUEENSLAND.

Times Computed by D. EGLINTON, F.R.A.S.

TIMES OF SUNRISE AND SUNSET. **AT BRISBANE.**

1920.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		PHASES OF THE MOON, ECLIPSES, &c.
Date.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	Rises.	Sets.	
1	6:1	5:35	5:29	5:47	4:59	6:5	4:46	6:28	(The times stated are for Queensland, New South Wales, and Victoria). H. M. 6 Sept. ☾ Last Quarter 5 5 a.m. 12 " ● New Moon 10 52 p.m. 20 " ☾ First Quarter 2 55 p.m. 28 " ○ Full Moon 11 57 a.m. Perigee on 9th at 8:12 a.m. Apogee on 21st at 8:42 a.m. 5 Oct. ☾ Last Quarter 10 54 a.m. 12 " ● New Moon 10 50 a.m. 20 " ☾ First Quarter 10 30 a.m. 28 " ○ Full Moon 12 9 a.m. Perigee on 4th at 7:54 p.m. and 31st at 12:26 a.m. Apogee on 16th at 4:42 a.m. A Total Eclipse of the Moon will occur on the night of the 27th, commencing about 11:30. An hour earlier it will be entering the dark shadow of the earth. 3 Nov. ☾ Last Quarter 5 35 p.m. 11 " ● New Moon 2 5 a.m. 19 " ☾ First Quarter 6 13 a.m. 26 " ○ Full Moon 11 42 a.m. Apogee on 16th at 12:18 a.m. Perigee on 27th at midnight. The Moon will cause a partial eclipse of the Sun during the night of the 10th, visible only on the other side of the world, including Great Britain and Ireland. 3 Dec. ☾ Last Quarter 2 29 a.m. 10 " ● New Moon 8 4 p.m. 19 " ☾ First Quarter 12 40 a.m. 25 " ○ Full Moon 10 39 p.m. Apogee on 13th at 3:30 p.m. Perigee on 26th at 10:24 a.m.
2	6:0	5:35	5:28	5:48	4:58	6:6	4:46	6:29	
3	5:59	5:36	5:27	5:49	4:57	6:6	4:46	6:30	
4	5:58	5:36	5:26	5:49	4:57	6:7	4:46	6:31	
5	5:57	5:37	5:24	5:50	4:56	6:8	4:46	6:32	
6	5:56	5:37	5:23	5:50	4:55	6:9	4:46	6:33	
7	5:55	5:37	5:22	5:50	4:55	6:9	4:46	6:33	
8	5:54	5:37	5:21	5:51	4:54	6:10	4:47	6:34	
9	5:53	5:38	5:20	5:51	4:53	6:10	4:47	6:31	
10	5:52	5:38	5:19	5:51	4:52	6:11	4:47	6:35	
11	5:50	5:38	5:17	5:52	4:52	6:12	4:47	6:35	
12	5:49	5:39	5:16	5:52	4:51	6:13	4:48	6:33	
13	5:48	5:39	5:15	5:53	4:51	6:14	4:48	6:36	
14	5:47	5:40	5:14	5:54	4:50	6:15	4:48	6:37	
15	5:46	5:40	5:13	5:55	4:50	6:16	4:49	6:37	
16	5:45	5:41	5:12	5:55	4:49	6:17	4:49	6:38	
17	5:44	5:41	5:11	5:56	4:49	6:18	4:49	6:38	
18	5:43	5:42	5:10	5:56	4:48	6:18	4:50	6:39	
19	5:42	5:42	5:9	5:57	4:48	6:19	4:50	6:39	
20	5:41	5:43	5:8	5:58	4:48	6:20	4:50	6:40	
21	5:40	5:43	5:7	5:59	4:48	6:21	4:51	6:40	
22	5:39	5:43	5:6	5:59	4:48	6:21	4:51	6:41	
23	5:38	5:44	5:5	6:0	4:48	6:22	4:52	6:41	
24	5:37	5:44	5:4	6:0	4:47	6:22	4:52	6:42	
25	5:36	5:44	5:4	6:1	4:47	6:23	4:53	6:43	
26	5:34	5:45	5:3	6:1	4:47	6:24	4:53	6:43	
27	5:33	5:45	5:2	6:2	4:47	6:24	4:54	6:44	
28	5:32	5:45	5:1	6:2	4:47	6:25	4:54	6:44	
29	5:31	5:46	5:0	6:3	4:47	6:26	4:55	6:45	
30	5:30	5:46	5:0	6:3	4:47	6:27	4:56	6:45	
31	...	...	4:59	6:4	...	...	4:57	6:45

For places west of Brisbane, but nearly on the same parallel of latitude—27½ degrees S.—add 4 minutes for each degree of longitude. For example, at Toowoomba the sun would rise about 4 minutes later than at Brisbane if it were not for its higher elevation, and at Oontoo (longitude 141 degrees E.) about 48 minutes later.

At St. George, Cunnamulla, and Thargomindah the times of sunrise and sunset will be about 18 m., 30 m., and 38 minutes respectively, later than at Brisbane.

At Roma the times of sunrise and sunset may be roughly arrived at by adding 16 minutes to those given for Brisbane, but an allowance of 3 or 4 minutes more is sometimes necessary.

The moonlight nights for each month can best be ascertained by noticing the dates when the moon will be in the first quarter and when full. In the latter case the moon will rise somewhat about the time the sun sets, and the moonlight then extends all through the night; when at the first quarter the moon rises somewhere about six hours before the sun sets, and it is moonlight only till about midnight. After full moon it will be later each evening before it rises, and when in the last quarter it will not generally rise till after midnight.

It must be remembered that the times referred to are only roughly approximate, as the relative positions of the sun and moon vary considerably.

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MONARO BEEF CATTLE.

Dalgety and Company effected a record sale of fat cattle at the Homebush yards a few weeks ago. The cattle were of great weight and quality, from the Bibbenluke Estate, Monaro. They arrived in excellent condition. Three bullocks were first brought under the hammer. One was sold at £70, the second at £69 1s., and the third at £61 11s. The three averaged £66 17s. 6d. each. Six cows were then offered. The first brought £47 11s., the second £46 16s., and the other four were sold at £34 6s. each. Six steers were then sold at £33 11s. each. The fifteen head of cattle realised a total of £627 9s., or an average of £41 16s. 7d. They were station-bred Shorthorns, about 7 years old, and were in first-class condition. There was a good deal of speculation at the yards as to the weight of the three bullocks. The heaviest ox was estimated to weight between 1,700 and 1,800 pounds, and the average weight of the three set down at about 1,600 lb. each.

SUNFLOWER SILAGE.

In the last issue of the Journal we published some notes by J. F. Keane, Cairns district, on the value of the sunflower as a fodder for stock and as a valuable oil producer. The Perth "Farmer," W.A., in the issue of 5th September, contains the following description of experiments made in Montana (U.S.A.) to ascertain the relative values of sunflower silage and lucerne and other crops as fodder for dairy cattle:—

"For many years past experiments have been carried out at the Montana State College, and the director stated recently that sunflower silage had proved an excellent food for cattle, especially dairy stock, as not only did it possess great milk-producing qualities, but the yield per acre was far in excess of either lucerne or Timothy grass.

"On the farm of Mr. W. M. McDowell, Lieut.-Governor of Montana, last season an area of five acres was sown with sunflower of the Russian variety. Some details of the results were published in a recent issue of the 'Country Gentleman.' The plants stood 6 feet to 8 feet tall as a general average, though some plants reached 15 feet in height. The cost of the seed per acre was about 16s. 8d., and the cost of ploughing and harrowing was an extra 20s. per acre. The ground had been prepared in May, and seeded in June.

"The sunflowers grew in rows 30 inches apart and were about 6 inches apart in the rows, and during the growing season the plants were cultivated between the rows just as corn would be. The summer of 1919 was unusually dry in Montana, and a little irrigation was used. A good supply of water caused the sunflowers to grow larger, but it has been said that they can be raised on what is commonly known as dry land.

"In cutting, Mr. McDowell used a corn knife. The plants were cut as near to the ground as possible, because every part of the stalk was wanted for silage. The harvesting operation was very simple and necessitated the employment of only six men. Two of them cut the plants, and another two hauled the sunflowers in wagons to the silo, one fed the chopper, and the sixth played a hose on the sunflowers as they passed through the chopper. The 5 acres was cut, harvested, chopped, and deposited in the silo in six days, or 48 hours of actual work.

"The general method of using the sunflowers for silage was to cut them green and to prepare them at once for the silo, although farmers that did not have a silo had obtained very satisfactory results by cutting them green and stooking them.

"At the current prices in Montana last season the sunflower was worth £80 per acre, as compared with £24 per acre for lucerne, and £14 for Timothy grass.

"Commenting upon these results, Mr. McDowell said that by growing sunflowers a farmer could winter twice as many cattle as he could by raising lucerne, clover, rye, barley, redtop, or any of the ordinary grasses or crops that were raised for cattle feed in Montana."